COMMODORE user

Incorporating Vic Computing Volume 1 Issue 9 June 1984 UK price 85p

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★ Butterfield ★ Tommy ★ Readers programs ★ Free classified ★

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ON WITH THE SHOW


WORD PROCESSING
57... VARIETIES...
SHRIEK!

At last – the wired CBM

Commodore's sneak announcement this month is a modem for the 64. That opens the world – literally – to every hacker with enough wit to be able to plug in a cartridge and dial up a sequence of 21 figures.

Karl Dallas has been talking to CBM's Compuserve computer in Ohio, USA – and running up enormous phone bills ever since Commodore lent him the first of them. Here is his report.

After all the talk in recent years about the wired society, Commodore's entry into the new age was almost an anti-climax – and a complete contrast to the razzamatazz of their announcements at Hanover in April.

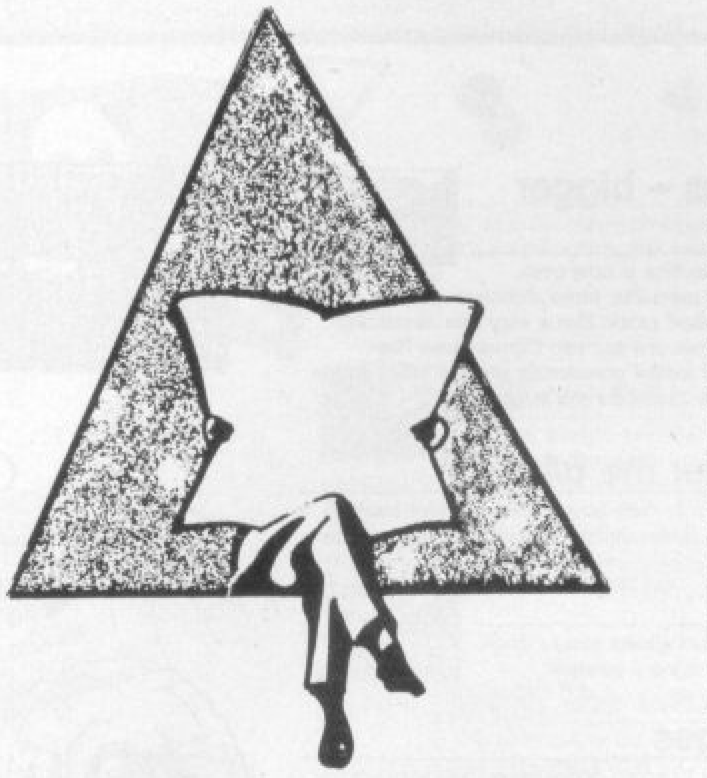
In fact, if you weren't already wired up yourself you would certainly have missed it: the only word to come out from Slough was whizzkid John Collins' happy announcement to Micronet 800 subscribers (on page 800812292, if you'd like to read it for yourself) that the 64 modem was at last available. He also said that "several" of the modems (I understand the exact figure is about 3,000) were in stock and ready to go to everyone prepared to fork out just under £100 for them, mail order only. (In case you think Commodore is getting a touch of the Clive Sinclairs, let me reiterate that the modems do exist and are ready to mail right now!)

This is really good news to me especially, because for over a year I've been trying with no success whatsoever and increasing frustration to link up my computer to the rest of the world. In fact I even went to the extent of getting myself a Spectrum because I'd heard the problems had mostly been solved on Uncle Clive's icky-keyed darling.

For most people, wiring up to the world means one thing: joining British Telecom's Prestel network by way of Micronet 800.

Prestel is just a huge mainframe – actually, three mainframes – crammed with all sorts of fax and info that people might want to know, from the top of the Charts to the current price of wool futures in Sydney, Australia.

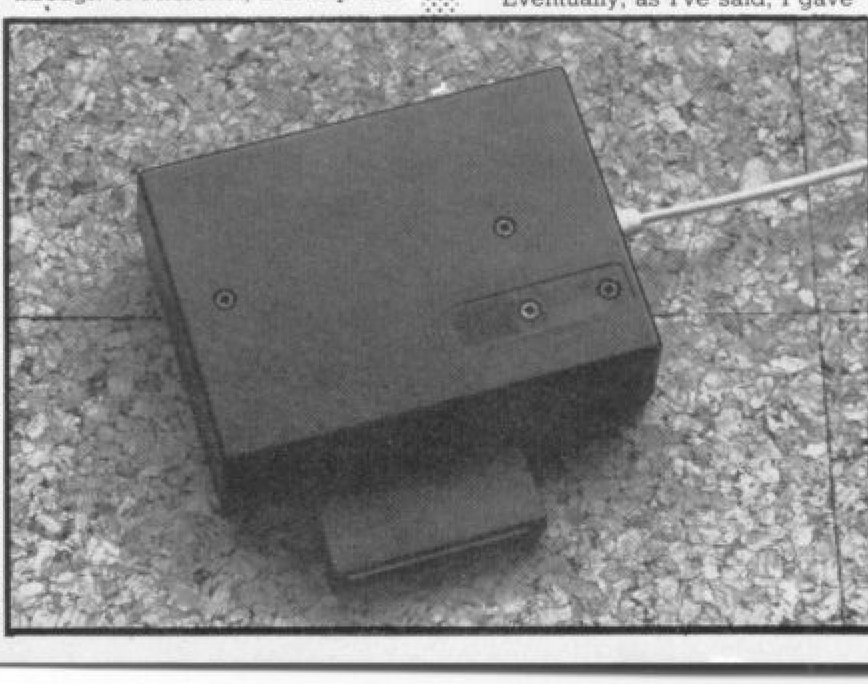
But really it's one of those great ideas that's still waiting to take off, a solution waiting for a problem to deal with – regarded by people with 'proper' databases as something of a toy: fascinating to play with, maybe, but (unless you happen to be one of the travel agents who seem to find it very useful to check things like flying times and the latest cheap tours) of no practical use.



When it first came out, Prestel was touted around by the TV rental firms; and you had to communicate with it by a numeric keypad – which was fine for yes/no choices, but didn't offer much chance of real interactive communication. Then one or two companies started making black boxes which allowed a micro to talk back to the big brother mainframes; and at the 1983 Which Computer Show there came the break-through of Micronet, a cheap and cheerful way of connecting up micros to Prestel – and even down-loading telesoftware (often free) on to them. Among the machines able to do it were the BBC, the Spectrum and (I was assured) the Pet. "Including an 8096?" I asked; and was told yes, but there wouldn't be much business telesoftware available for a while.

I won't bore you with the long months of fiddling around inside various Pets trying to connect up UART boards to the J3, J4 and J10 pins on their CPUs, the modems supplied and special sockets fitted for me by the GPO (including a special old-fashioned handset, since I found the acoustic coupler supplied by Micronet didn't fit the new-style receivers being advertised so actively by BT).

Eventually, as I've said, I gave up and got a Spectrum, which worked first time – but only a week later I spotted the news about the 64 modem, which makes everything before it like relics from the stone age.



It's a rather bulky black box that plugs into the cart port with a long lead and one of those new-fangled square jackplugs BT are fitting wherever they get the chance.

With the modem supplied by Micronet's affiliate Prism for the Spectrum, you have to dial up the computer (either 686 0311 or 618 in London) on the phone; then when you hear the high-pitched carrier signal you flick the 'on/off line' switch down, return the receiver, and – with about a 50:50 chance of success – you're on.

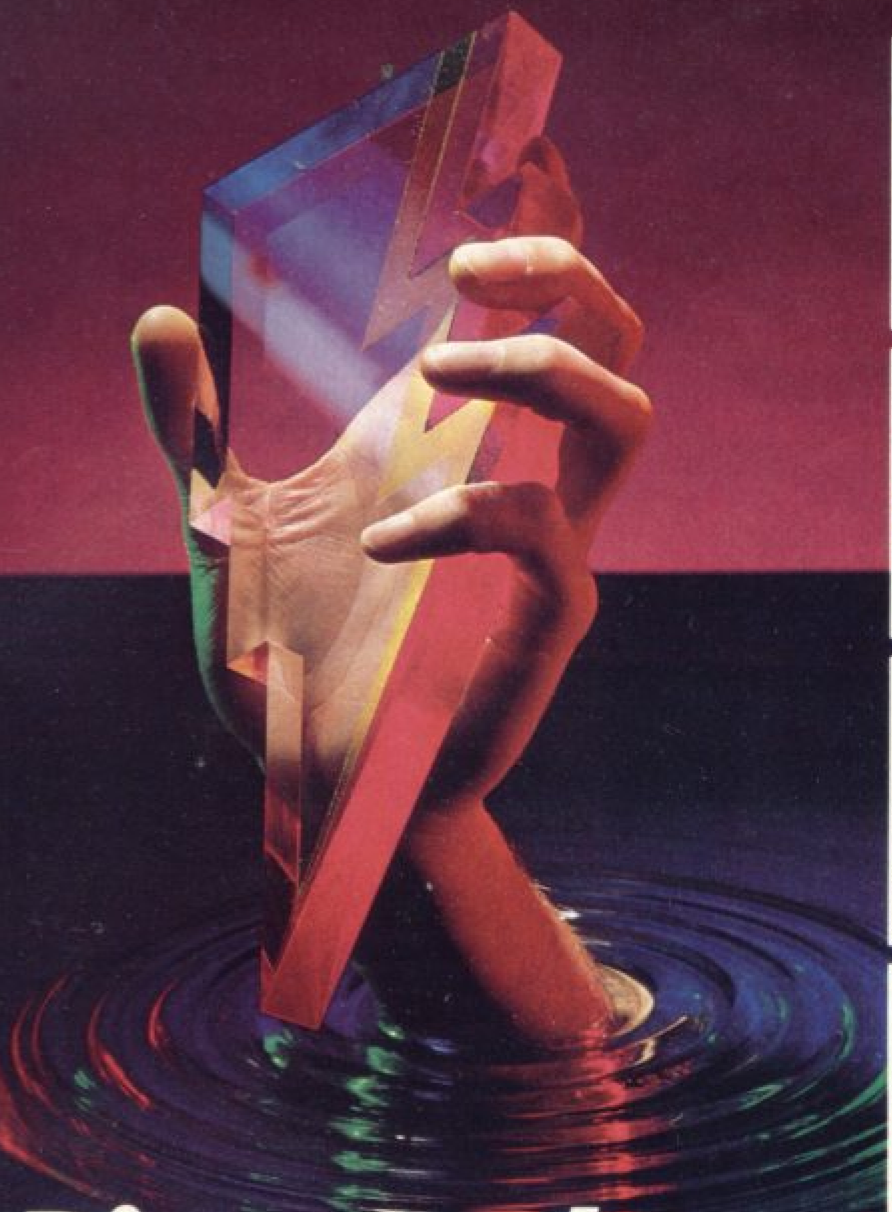
You have to type in a ten-figure customer identifier followed by a four-figure password (to stop people running up bills on your account) and you can start finding out things you thought you never wanted to know, and were probably right.

The 64 modem does all the dialling for you. But while users of old-fashioned TV-plus-keypad set-ups can program their equipment to take care of the identification codes, there appears to be no way of doing this with the 64 modem. I have no problem remembering my nine-digit VAT registration number, so I suppose one extra number shouldn't tax my memory very much. In the meanwhile, I've written it on a sticky label on the modem.

A bigger problem, if you have to confine your hacking to popular times like Saturday afternoon, is that if the computer is tied up, the modem disconnects automatically after a short wait. Surely it could have remembered the number and kept redialling until it got through?

K-tel disks

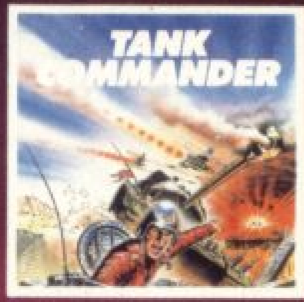
K-tel has joined the increasing band of software houses now making cassette games available on disk. That means you'll now be able to buy three of its games for the Commodore 64 – *Cityattack*, *Oddyssey* and *It's Only Rock 'n' Roll* – on disk, for £9.95. Will you be able to resist the floppy onslaught for much longer?



Discover these new games for VIC-20...

These six new games written in 100 per cent machine code, set high standards of playability and really make the most of everything the Vic has to offer. Games of action and strategy, great graphics, glorious colour and full sound effects. Try Submarine Commander, Tower of Evil or Mine Madness and you'll want to try all six.

You should be able to find these games from Creative Sparks at your usual software supplier but you can also order them directly from us, completing the form below.



All action game with strong strategic element. Penetrate the enemy defences and blow up the ammunition and fuel dumps.

This great game features:
- Superb sound and graphics.
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- Joystick or keyboard operation.
- One or two player game.

Requires 8K RAM expansion.
Cassette **£5.95**



Attack and destroy all enemy shipping.
That is your brief in this exciting game of strategy. Can you stand the nerve tingling action spread over three screens provided by this amazing game.
Already a big hit in the USA.
Superb scrolling screen in periscope mode.
Nine pre-selectable levels of play.
Keyboard or joystick operation.

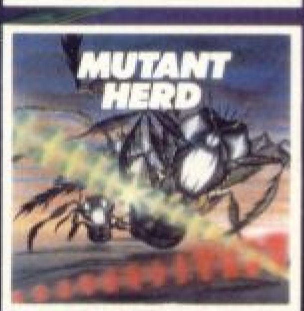
Requires 16K RAM expansion.
Cassette **£5.95**



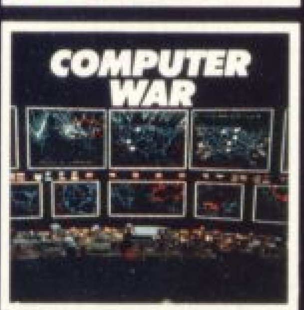
Action rages throughout.
Move from 70 rooms in the maze-like Tower of Evil, inhabited by such evil creatures as the Baphonets and the Warriors of Ayperos. To defend yourself, you throw fireballs from your fingertips on your journey to rescue the princess.
Superb action graphics in this 100% machine code game.
One or two player game.
Joystick or keyboard control.
Requires 8K RAM expansion. Cassette **£5.95**



Gold mining with a very big difference.
Half-crazed monsters and lifts which eerily move up and down of their own accord have to be faced in this unusual game.
Seven levels of play.
High score feature.
Keyboard or joystick operation.
Runs on unexpanded Vic-20.
Instant plug-in cartridge action at cassette prices **£9.95**



Protect the powerhouse from the crazy mutants with the help of your powerful crossed laser beams. Guide the laser into the mutant burrows to destroy the eggs.
This unusual and exciting game benefits from two screens of all action play.
One or two player game.
Runs on unexpanded Vic-20.
Instant plug-in cartridge action at cassette prices **£9.95**



Based on the hit movie "War Games."
Using both strategy and good shooting destroy the incoming missiles and avoid the holocaust.
An amazing game with superb scrolling landscape when tracking missiles.
High tension play when trying to crack the code.
Keyboard or joystick control.
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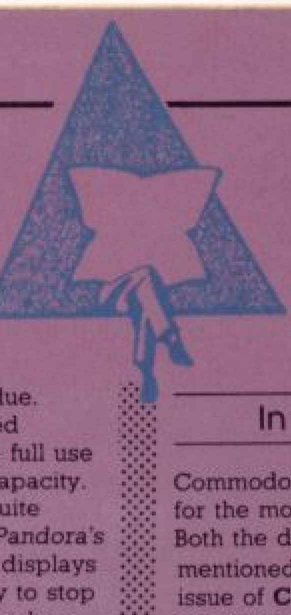
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Software briefing

Commodore's recent Software Briefing may have sounded like a high-powered affair – but it wasn't. It merely gave already zap-hardened journalists the chance to try out Commodore's latest soon-to-be-launched software offerings.

That amounted to a whole range of educational and games software (it's getting difficult these days to distinguish between the two) – mainly for the 64. A solitary not-plugged-in Vic lurked at the far end of the table. We were assured that new games are being launched for it. So why weren't they being displayed? Well, someone had forgotten to bring the required RAM pack – a lame excuse.

Fishing for games

For arcade-action enthusiasts, Commodore was displaying a range of five games for the 64: *Mayhem*, *Pandora's Box*, *Punchy*, *Little Icarus* and *Humphrey*. Names sound familiar? Quite right, they're all from the Mr Micro software house.

Commodore doesn't write it's own software; it regularly engages in what Commodore UK's software boss Gail Wellington calls "a cast-the-net operation". Having cast it, she hauled in Mr Micro – for two reasons: "they have good software, and they were willing to be marketed. Mr Micro is more interested in *creating* than *marketing* software".

With Commodore's mighty marketing muscle behind it, Mr Micro is already working on new material exclusively for Commodore – and probably smiling while he does so.

The five games will cost you £5.99 each on cassette. But disk drive owners can buy the whole set on one disk for just £19.99; that sounds like good value.

Unlike some disk-based games, these don't make full use of the disk's increased capacity. But many of them look quite good and original. Like *Pandora's Box*, for example, which displays a nice 3D effect – you try to stop various nasties leaving the box. In *Little Icarus* you fly the winged youth through mythical Greece to find his dad – don't fly too near the sun, though. *Punchy* is based on Punch and Judy, complete with sausages and rotten tomatoes.

And it looks as though the trend for acquiring games from already-established software houses will continue. Apart from Mr Micro, Commodore is dealing with Starcade to market its *Savage Pond* game for the 64 under the Commodore umbrella; and there's a link with Widget Software too, though no details are to be had yet.

Work and play

Commodore has also acquired some educational games for 5-to-12 year olds from Applied Systems Knowledge, a London software house specialising in 'fun-learning' on micros for kids. The range is available for the 64 only and most of the games come on cassette at £5.99 each.

On cassette there's *Let's Count* – four counting programs for tiny tots; *Hide and Seek* – a visual memory game (two cassettes for £9.99); *Face Maker* – lets you make a multitude of ugly/funny faces; and *Words, Words, Words* – use words to build up a picture from a range of ten scenes (two cassettes for £9.99).

Last but not least is *Number Painter*, a Manic Miner-type maths game with pretty impressive graphics. That's being produced in cartridge form, costing £9.99. And Gail Wellington's pretty pleased about it. "It's got the playability necessary for education games",

In the picture

Commodore's also got something for the more creative-minded. Both the drawing packages we mentioned briefly in the April issue of **Commodore User** were on display.

Rolf Harris' Picture Builder (cassette only, £5.99) is a low-resolution package. You use joystick or keyboard to select and draw with any of the characters and graphic shapes the 64 can produce. More advanced is *Tony Hart's Art Master* (cassette £5.99, disk £9.99) which gives you a high-resolution drawing facility also using a joystick or keyboard.

Finally, to the Vic. That gets a program called *Music Writer* (cassette, £5.99): allows you to compose a tune and play it back in various different forms. The Vic also gets a range of arcade-type games on cassette, for £4.99 each; and there's a four-pack of unexpanded games too for £9.99.

Speaking out

So what's Commodore got under development? Well, it's introducing more software to run with its Magic Voice speech synthesiser for the 64. The latest project is the 'Talking Books' series: titles include *Magic Garden* and *Magic Toolbox*.

Each package contains five stories for children to read and write. Sections of text are illustrated on the screen and 'read' by the voice module. There's a dictionary too, so children can get an explanation of any words they don't understand – no prices or availability dates yet, though.

You need Magic Voice to make the Talking Books work, but the module is optional for the *B.J. the Bear* series of basic reading and writing programs. Those are being developed by the Educational Psychology department at Birmingham University – real educationalists. Again, no real product or prices yet.

So it looks as though Commodore's commitment to software is continuing according to plan – not just to games but to more practical and useful software. Moreover, it's not just announcing availability but showing us the real stuff – unusual for Commodore.

Robotic chores

BP Oil organised its first Buildarobot Competition last year. That generated such a lot of entries – over 1,000 of them, especially from schools – that it's running the contest again.

But this year the sophistication level is going up.

Last year, BP asked you to build a robot that would retrieve a cube. This time you're set the more ambitious task of constructing either "a freestyle robot to perform a useful domestic task", or go for the set challange of building "a mobile robot to serve a drink to each of two people seated in a room" (mine's a double).

No need to hurry, though; the National Finals aren't until October 1985. But you must be aged under 19 on 31 August of that year to be eligible. Prizes? Those haven't been fixed yet but the total hand-out will be more than £3,000.

Last year, winners got £500 each with lesser sums for runners-up (and that figure should increase this year). Of course, money isn't everything; you could get yourself on the telly (last year's winning robot chased Selena Scott round the TV-AM studio – no extra prizes for that).

According to Brendan Lomax, BP's PR man, "all sorts of computers were used but quite a few entries were based on the Commodore 64". He emphasises that the competition is really designed for schools; so if yours hasn't received BP's information pack, it can acquire one from Mrs Francis Parker at BP Oil Ltd, BP House, Victoria Street, London SW1E 5NJ.

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We do not keep our subscription records on the premises; so if you have a query, calling us only adds time and doesn't solve the problem.

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ARCADE ACTION & ADVENTURE WITH... COMMODORE 64



Mobydick

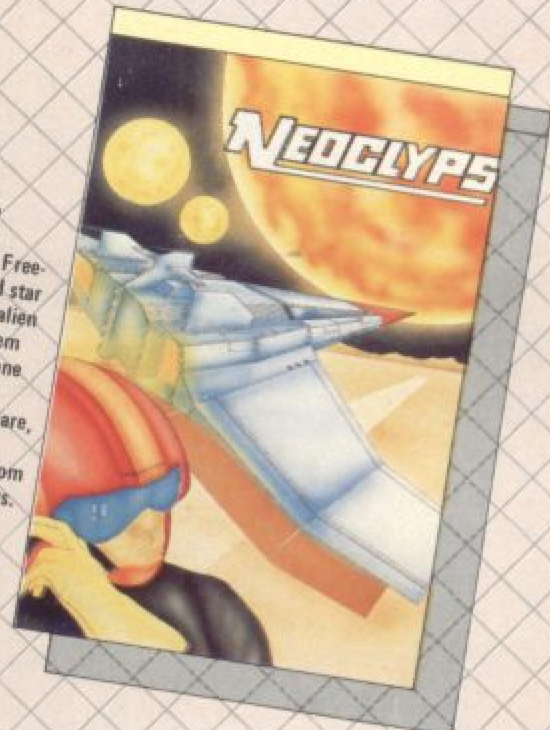
The object of this game is to blow up submarines, destroy the helicopter and catch the falling pilot, but do not kill the whale.

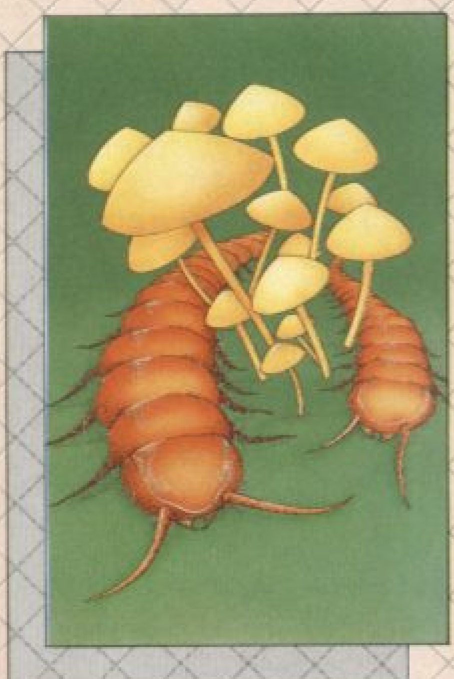
£7·95

Neoclyps

You are the GOOD GUY, Freedom Fighter and renowned star pilot. The BAD GUYS, an alien race from distant solar system have invaded NEOCLYPS, one of your colonial planets. Being the good guy that you are, you set off to liberate the Common Folk of Neoclyps from the oppression of the Bad Guys. The Bad Guys have populated Neoclyps with several radar towers which reveal your position to them.

£7·95









Cosmic Split

You are caught in a vicious jungle of giant insects. Centipedes are attacking you from all sides. Killer fleas are dropping from the sky, and to top things off there's a venemous spider lurking in the background.

£7·95

Metroblitz

The object of this game is to defend your city against an onslaught of suicidal aliens.

£7·95

Kystals of Zong

Your object is to overcome various obstacles and overpower creatures intent on stopping you as you progress on your quest for the Krystals of Zong. Quick reactions will be necessary if you are to succeed clues will guide you.

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WE PLEAD NOT GUILTY

Dear Voice of the Industry:

COMPUTER GAMES PIRACY

This letter is being sent to all specialist microcomputer magazines and concerns the cancer that is eating the very heart of our industry.

Computer games software is the dynamic success story of the current economic recession and is an area where, for a change, Britain has a tangible lead over competing countries. The games software industry is part of the emerging leisure technology industry and our lead in games will be reflected in other areas of terchnology as they emerge, given a chance.

The boom in games software has created jobs, not only directly but in printing, duplicating, advertising and in the magazine industry. As leisure technology progresses it could become a major source of employment.

All this is being jeopardized by the selfish activities of members of the public who are copying games instead of buying them, this is theft. We are not talking about isolated instances, we are taliking about "user groups" running mini-production lines at their evening meetings and stealing as many as 2000 copies of successful individual titles at one go. Conservative estimates regard seven copies for each legitimate product as being a realistic overall picture of the marketplace.

This is risking the livelihoods of everyone in the industry, including the magazines. The games companies have far less to spend on advertsing space and if the epidemic continues will have less still. This is the reality of the situation.

The media is a powerful force yet in this instance is doing little or nothing to use this power. Some magazines even carry small advertisements for blatant copies, some magazines have actually carried editorial condoning the thieves. They are cutting off their nose to spite their face.

The time has come for all computer magazines to follow a concerted campaign to stop piracy. Editorial must campaign for law changes creating harsher penalties. The copying clubs must be exposed. Advertising executives must filter out the pirates adverts. Piracy must become unpopular.

It is no good expecting the software companies to solve the problem, they have not the organisation or power – it is the



media that has. Any magazine that does not act is not facing up to reality.

David Henry Lawson, chairman, Mark Lawrence Butler, managing director, Ian Hetherington, financial director, Bruce Everiss, operations director, Imagine Software Ltd, Imagine House, 5 Sir Thomas Street, Liverpool, Merseyside L1 6BW.

In your assessment of the software market you will have noted the general concern over the levels illicit copying of programs is believed to have reached.

The Guild of Software Houses is active in seeking measures to restrict this threat.

In this respect magazines can assist by adopting a responsible attitude in the acceptance of advertisements which may be considered against the best interests of the industry.

The commercial success of any publication is, of course, the criterion and revenue from this source is a fundamental consideration as is the continuation of creative products which provide a significant information base for journalists and their medium.

The displays generating most consternation appear to be concentrated in the classified section.

It is noe time for the press to be seen to act in a creditable manner and support this campaign to eradicate piracy.

Response on this matter will be measured in the form of a survey conducted by G.O.S.H. during 1984.

Yours faithfully

Rod Cousens, Vice Chairman, Guild of Software Houses.

COMMODORE USER SAYS:

So software piracy is the fault of the micro media, is it?

Of course, if illegal copying on the scale alleged by Imagine's letter is going on – and we await the prosecutions of those "user groups" (their quotes) who have employed assembly-line techniques to duplicate as many as 2000 copies of successful titles in breach of copyright law – is it to be condemned? and we *do* condemn it, as regular readers will know.

On the other hand, the industry's obsessive concern with "protection" puts the honest user wishing to create security back-up copies, or a suite of much-used programs on a single disk, into the dock alongside the true pirate. That often diverts energies which might be better devoted to improving the basic product and ensuring a viable after-sales service to users, particularly of business and utilities software.

This letter ignores the motivations of most of those who resort to 'piracy'. Rarely is it the sort of big business that has bedevilled the video trade. It's more like the situation in the music business, where people resort to copying albums on to tape because it's one way of ensuring a reasonable-quality version of the best music on offer – rather than the click-and-hiss compilations of occasional highlights surrounded by track after track of mediocrity that is the average contemporary pop LP.

Similarly, there is so much duff computer software about – stuff that won't LOAD or RUN, and stuff that's boring or doesn't deliver what is promised on the box. It is hard to condemn those who want to share their discoveries with their micro-mates.

Nevertheless, if the Imagine directors want to condemn piracy, then OK: computer piracy is wrong, immoral, and ought to be illegal, if it isn't already (we need a test case to prove whether the copyright laws actually apply).

We are also against sin (some sins, anyway): but we don't think pious declarations will abolish it.

And we are always against manufacturers distributing software that has been inadequately debugged, duplicated without the necessary quality-control to eliminate the non-RUNners, and presented in covers whose art bears scant relation to the image on the screen when it's finally persuaded to perform.

As a magazine, we like to think we our doing our part to weed out the duff programs. We *do* refuse ads that we know are for copying devices and programs, though these are readily available elsewhere; and anyway we doubt that they are the real cause of the trouble.

We are also opposed th so called 'cures' like the tape levys and similar walnut-crushing steamhammers being proposed in some circles. These are generally worse than the ills they are supposed to handle, and they extend Government interference into areas of life and recreation where the snooper and the money-grabbing bureaucrat have no business intruding.

We don't think anyone owes us or the software companies a living. And we regard their advertising with us, not as charity from a grateful industry, but as a hard-headed, commercial acknowledgement of the editorial policy which made us the best-selling user-specific micro mag within a month of our going on to the bookstalls. ■

PIRATES were high seas robbers sailing an armed vessel without legal commission. They waylaid and robbed any vessel that looked a likely prize. Piracy is as old as sea-trading. The great Roman, Julius Caesar, was once captured by pirates.

The most dreaded pirates of the Middle Ages were the Barbary pirates, with their headquarters at Algiers and neighbouring ports. They were Moslems, and delighted to capture Christian seamen, whom they sold as slaves.

The riches of the Spanish West Indies attracted pirates of all nations. They lay in wait off the Portuguese and Spanish coasts, and often snatched a prize from under the guns of the armed galleons.

During the 18th century, pirates



Late for Valhalla?

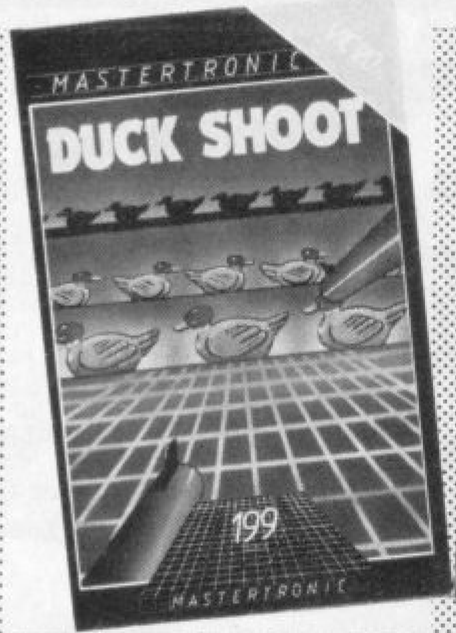
Legend's *Valhalla* was launched last October on the Spectrum; it's grabbed £2 million in sales since then and has won two games awards. But it's only now available on the Commodore 64, at a beefy £14.95.

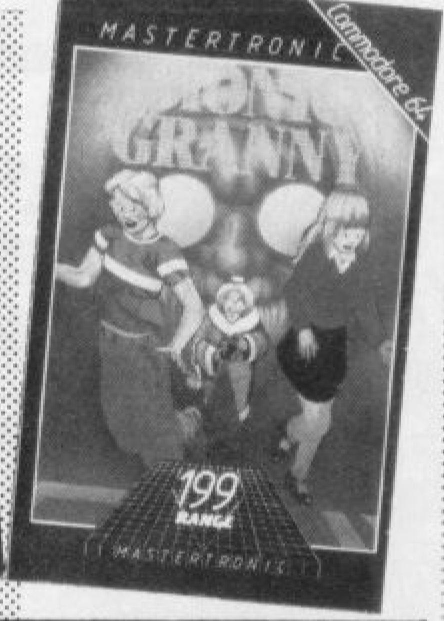
That's seven months after its initial launch – and a sackful of assorted computer games have grown old and mouldy since then. Why has the conversion taken so long? And is *Valhalla* on the 64 a legendary dead duck?

"The 64 poses a lot of technical problems", explains John Peel, Legend's proprietor. "Converting Valhalla to the 64 was more difficult than actually writing it for the Spectrum. But that conversion is a dramatic improvement on the original. Everything happens more quickly, making the game more challenging."

Peel has no doubts that, despite *Valhalla*'s comparative longevity, it will sell on the 64: "We expect it to reach the top of the Commodore charts immediately on release – we've already got over £250,000 of advance orders. *Valhalla* is unique; it's not an adventure game but an interactive computer movie". We'll be reviewing it soon – popcorn in hand.







Cut-price games

The computer games software industry has already publicly aired its feelings about illegal tape copying, gloomily predicting the industry's demise if the pirates aren't scuppered.

But more intimations of disaster follow: this time from Derek Meakin, head of National Micro Centres (sounds very official, but it's a retail shop chain). According to him, the industry may soon be "cutting its own throat", thanks to the cut-price operation of Mastertronic, a new games software company.

Mastertronic has what is called "a revolutionary pricing policy"; that means you'll pay just £1.99 for a game-tape – three for the price of one, as it were.

Is Mastertronic trying to prove something? "Mastertronic will endeavour to prove what the market has long believed – that software currently available is generally overpriced." So asserts Martin Alper, one of Mastertronic's directors.

Over to Meakin: "This might sound fine for the computer user. But many of the software houses are working on very tight margins already, and a price-cutting war could well bankrupt the more vulnerable one.".

Then there's the question of remuneration for software writers; if the royalties are low, "this means that quality – and standards – will slide rapidly".

Of course Mastertronic doesn't see it that way; it's offering those small software-writing concerns the chance to sell in large volumes, with Mastertronic using its distribution and marketing skills to sell to supermarket chains, garages, newsagents, hi-fi dealers and the like – places you wouldn't expect to find games. The intention is to encourage what it calls "impulse buying". But you'll also find the Mastertronic range in places like Boots, W.H. Smith and the retailers supplied by the big distribution chain Websters.

Mastertronic took a stand at the recent Home Computer Show in Manchester and reportedly generated a great deal of interest – albeit with few sales. People weren't sure what to make of its bargain-basement games, it seems. But that was a few weeks ago. Martin Alper now reports that in its first three weeks Mastertronic sold 165,000 games nationally: and that one dealer clocked up sales of 400 in two weeks – somewhat quicker than selling hot cakes.

More than twenty "top quality games" titles are already available, of which eleven are for the 64 and four for the Vic. And Mastertronic is aiming for 50 titles by the Autumn, with plans for educational and business software. We've got a bunch for review and will be reporting soon.

Obviously the games sell because they're cheap but Alper doesn't see them as a substitute to top-quality and more expensive games; there's a strong place for those too. "The industry will settle down into a two-tier system. Our games don't take long to develop and will appeal to a lower age group". And their boredom threshold won't be very high – so you buy another one. Looks as though the age of disposable games has well and truly arrived.

Plug

According to B&R Electrical Products, a lot of sensitive electronic equipment is at risk from sudden spikes or surges on the mains – office computers and word processors, electronic typewriters, home computers, videos, cash registers, hi-fi equipment, instruments and controllers, and so on.

Mains-borne interference like that can be generated by switches, flourescent lights, motorised equipment, air conditioning, vacuum cleaners, washing machines, printers ... These everyday surges can be in excess of 3000V; thunderstorms can easily generate over 10,000V on the mains.

You won't then be too amazed to learn that "for such sensitive and valuable equipment B&R recommends fitting its new PowerCleaner surge supressor plug". This just replaces an existing 13 Amp mains plug, yet it can provide a dramatic reduction of up to 99% in equipment damage or disruption.

Most modern electronic gear is designed to withstand surges to 600 or 700V. Anything greater than this can actually cause permanent damage, though a one-time loss of data or program is more likely. The PowerCleaner plug effectively limits surges to 625V, a level at which B&R says "tests show a 99 per cent reduction in equipment damage from spurious surges".

Priced not unreasonably at £8.65 plus VAT, PowerCleaner is available from B&R stockists: further info on 0279 34561.

SHORTS

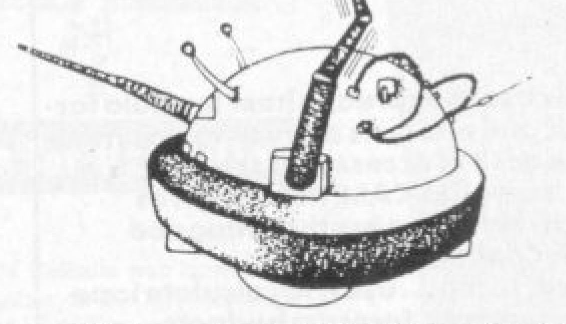
Button up: *Standard Commodore joysticks don't have a pushbutton on top of the stick, which happens to be an obvious and very handy place for a fire button because you can hit it with your thumb. But for £2.95, Computer Supplies will send you a Top Fire Button Kit with which you can quite easily add your own. We've tried it; the button itself is a bit small, but it works – and it does improve the joystick. If you don't fancy putting it in yourself, send your joystick with £4.45 to Computer Supplies at 146 Church Road, Boston, Lincs PE21 0JX. Barrie Hill at Computer Supplies also told us he can handle just about any repair to joysticks ...*

All the Best Courses for the CBM 64 and VIC-20

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A complete beginner's course for the CBM 64. It assumes no prior knowledge of BASIC and teaches by means of projects. The enclosed software contains a character generator, sprite generator, synthesiser and all six games developed in the text. **Included is also Honey. Aid 1 which adds 28 NEW commands to CBM 64 BASIC.**

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Tel: 01-441-4130

Courses are available from: W.H. Smiths, BOOTS, SPECTRUM stores and all good computer shops and many bookshops.

Four new machines, and that's official!

Excitement among the estimated 40,000 keen punters expected to attend the Fifth International Commodore Show at the Novotel, Hammersmith, London from June 7 to 9 will become even greater with the now official news that the company will be showing no fewer than four out of the six new machines premiered in Hanover in April, (see last issue) and that these are all definitely planned for release within the next six months.

The new ones are (in rising order of price):

- **Commodore 16,** a 16K machine due for September release at about £90 (all prices including VAT), possibly also in a £130 "starter pack" with cassette deck and software. Described by Commodore as "a very advanced home computer with features normally found on computers costing much more ... designed with first-time users in mind", in many ways the 16 could be considered as a 16K version of the 64. It has a slightly more sophisticated keyboard than its big brother, with four arrow-shaped cursor keys and a help key.
  This, they say, will be "a great asset when learning to program" since "it highlights errors in lines of programming right down to individual instructions and tells you why they went wrong".
  The 16 has Basic 3.5, which has over 75 commands "including built-in graphics and sound commands" as well as the usual toolkit functions often purchased separately, a built-in machine language monitor and a screen windowing capability.
- **Commodore's Plus 4** (originally known as the 264), also due in September, at a probable price of £250 or so. At first sight, the main difference between the 16 and the 264 seems to be the 60K of user-available memory available in the latter machine. In fact, the total ROM and RAM in the Plus 4 totals 96K. It will now come with "Three Plus One" (hence, presumably, the Plus 4 name) integral software, resident in ROM, consisting of a word processor, spreadsheet, records management (more of a mailing list program, rather than a fully-fledged database), plus a sophisticated business graphics program.
  "Three Plus One" was originally one of the features of the 364, but there are now no plans to release this machine in Britain.
- **The 8296,** an addition at the top of the 8000 business range, is actually being delivered now at a price of £914.25.
  It is similar to the 8096 except with 24K system memory in ROM and 128K user RAM. It is upwards compatible with the rest of the business range, meaning that 8032 and 8096 software will generally run without modification, but some exciting other languages will also be available, including UCSD Pascal.
- A further addition may come with the much talked about Commodore PC, based on the IBM compatible Hyperion. Details concerning its impending launch were unavailable at time of going to press.
- **SFS 481 disk drive,** with a maximum data transfer rate of 1675 bytes per second, allowing an average access time of 295 milliseconds;
- **DPS 1101 daisywheel printer** using a 100-character Triumph-Adler compatible typewheel, bi-directional printing at 18 cps, switch-selectable between CBM ASCII and standard ASCII, switch or software-selectable 10/12/15 or proportional pitch, offering underlining, bold and shadow print, horizontal and vertical tab, subscript and superscript;
- **MCS 801 dot-matrix colour printer** allowing seven-colour dump of high-res screen and letter printing at 38 cps with an 8 x 8 matrix;
- **1703 high-quality colour monitor,** suitable for use with a computer or VCR, and having a front-mounted composite video socket and rear-mounted sockets for luminance and chrominance and audio signals, in keeping with the current trend towards component video;
- **1531 cassette unit,** similar to the familiar C2N cassette drive, but with a DIN plug for the 16 and Plus 4 and a recording light.



In addition to the Commodore displays of hardware and software and the individual exhibits, the "features" of the exhibition itself will attract enormous interest, with the involvement of Radio Luxembourg on a daily basis, daily seminars organised by ICPUG, featuring lectures on the new PC, the shortly-to-be-launched Compunet service for owners of the CBM 64 modem, legal protection of software, and disk access, as well as a problems "surgery" (see panel for full schedule).

There will also be international football and basketball challenges, featuring soccer and basketball stars playing the highly-acclaimed cartridge games, TV "stars and planets" presenter Patrick Moore introducing his astronomy program, B.J. the Bear, star of the new talking educational software, appearing in person. A business simulation using the famed Corplan software, and illustrations of entries for the international computer art challenge, in a setting allowing would-be electronic artists to have hands-on experience of programming graphics are other attractions.

Users outside London will have a second chance to see the goodies on display at the Northern show in Leeds from September 27 to 29.

ON WITH THE SHOW

ACCOUNTING (BUSINESS)

Anagram Systems	**D19**
Electronic Aids (Tewkesbury) Ltd	**A2**
Handic Software Ltd	**D13**
JCL Software Ltd	**C27**
Micro-Simplex Ltd	**A51/A52/A53**
Pegasus Business Software	**F61**
Quick-Count Ltd	**A68**
Saxon Computing	**A1**
Supersoft	**A43**

Accounting packages for the small-to-medium size business increase in their power and sophistication, for instance *Anagram Systems'* INTEGRATED ACCOUNTING SYSTEM, v.IV and STOCKMASTER, both available for both the 8000 and 700 series, both of them fully-integrated single-disk programs.

Such software is also becoming available for the less powerful machines, for instance *Electronic Aids'* range of programs for the 64, added to their already well-known series for the 4000 and 8000 machines, such as PAYROLL and INTEGRATED ACCOUNTS, including purchase ledger, with aged creditors, sales ledger with invoicing to the user's own design, statements, daybooks, VAT analysis, stock control, automatic posting to nominal ledger with manual override, nominal journals, trial balance, complete audit trail, management reports, profit-and-loss, and balance sheet.

SUPERCLERK, a complete word processing/accounting/filing and payroll program for the small business, and HOTEL SYSTEM, including guest billing, stock control, guest records, word processing, and filing, will be shown by *JCL Software*.

The name of Simplex, associated with some of the most popular accounting stationery, is a hallmark on the *Micro-Simplex* off-the-shelf accounting system designed to run on the 8000 series, with entries following a similar format to that used in the familiar Simplex D book.

Another powerful package comes from *Pegasus*, actually a suite of seven programs, available individually or as an integrated system, consisting of invoicing with sales order processing, stock control, purchase ledger, sales ledger, nominal ledger, payroll, and job costing.

A CASH TRADER'S BOOK-KEEPING SYSTEM for the 64 can be rented for as little as £5 a week, complete with hardware, from *Quick-Count Ltd*, who will also be launching a LEASEHOLD PROPERTIES RECEIVABLES program which is believed to be the only one of its kind (£149.50).

ACCOUNTING (HOME)

Adamsoft	**A111**
Anagram Systems	**D19**
Handic Software Ltd	**D13**

The power of home machines like the 64 brings many of the electronic business tools to a much wider market, for instance CASH BOOK 64 from *Anagram* which has extensive nominal ledger and can produce profit and loss reports – very valuable for the self-employed or part-time businessman or club treasurer.

Other useful home programs include CHECKBOOK MANAGER and BUDGETEER from *Adamsoft*.

BUSINESS PROGRAMS AT THE SHOW

Anagram Systems	**D19**
APS Microsystems	**B37**
Dataview Wordcraft Ltd	**B35**
Handic Software Ltd	**D13**
Impex Designs (UK) Ltd	**A65**
Micro-Simplex Ltd	**A51/A52/A53**
Pegasus Business Software	**F61**
Precision Software	**H69/A146**
Quick-Count Ltd	**A68**
Saxon Computing	**A1**
Supersoft	**A43**
Tamsys	**B31**
Viza Software	**A135/A136**

Commodore business users who have so far been limited to the 96K memory of the 8096 with its rather complex memory banking, will be pleased to learn of the new generation of business machines on the horizon: the 128K 8296, the 256K Z8000 with Unix availability, and of course, the redesigned Hyperion, to be known as the Commodore PC, presumably to emphasise its IBM compatibility (see report from Hanover, last month).

All of these are expected to be on show, if only in prototype form.

But 64 users will be excited to know that they won't be left out of the bigger memory stakes. *RAM Electronics* are hoping to have a prototype of their new 256K expansion cartridge for the 64 at the show, and they're talking of a 512K expansion ready next year at about the time the first CBM PCs should become available.

More CPU memory, of course, also implies more memory required for data storage, and two "third party" companies will be offering hard disk and multi-megabyte cartridge options.

APS Microsystems' ALPHA 10 is a removable mass-storage cartridge for the 8000 and 700 series business machines, available in 10, 20, 30 and 40 megabyte versions with 20Mb of

ICPUG SEMINARS AT THE COMMODORE SHOW

Thursday June 7 16.00
Compunet and Networking
Brian Grainger

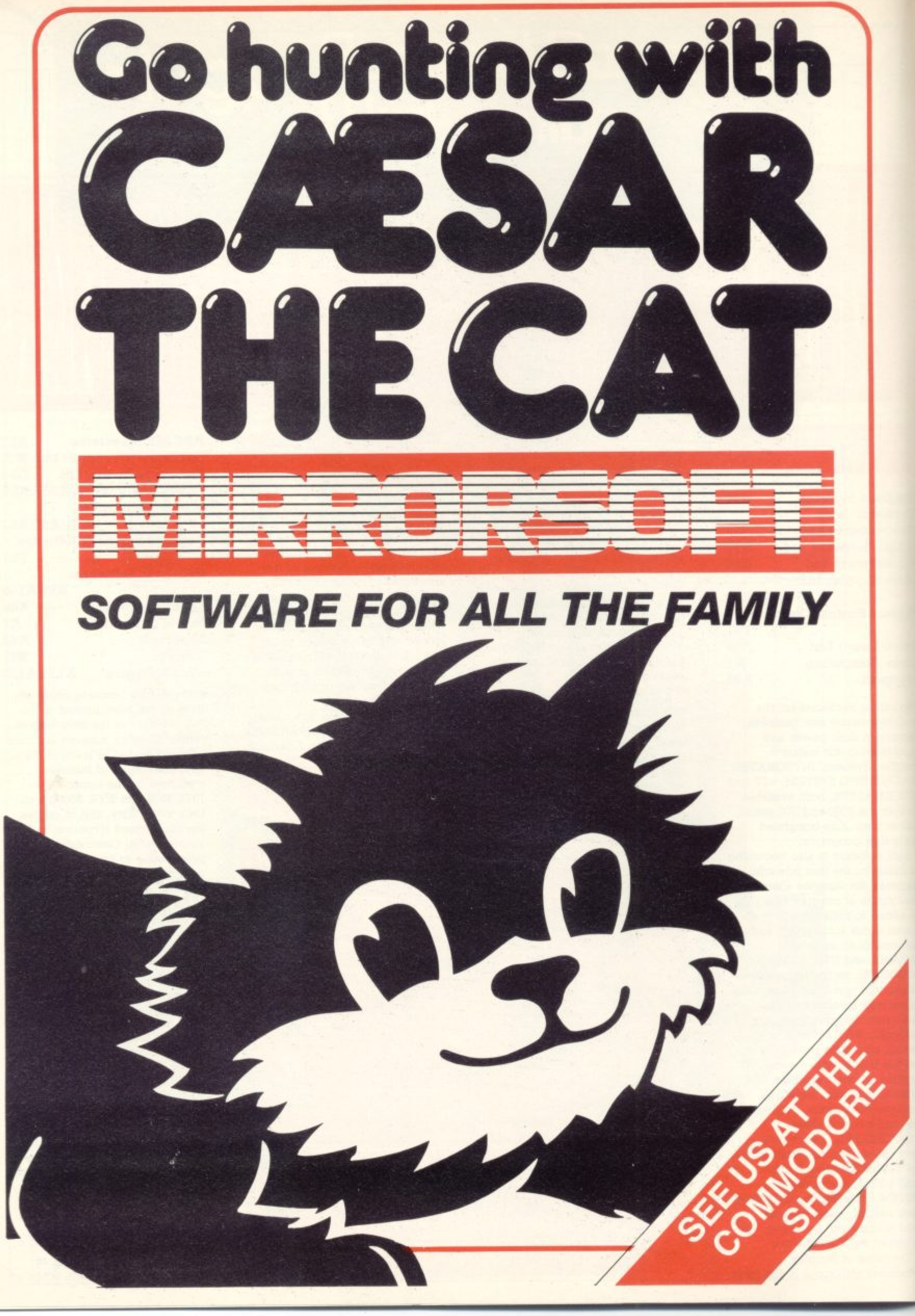
Thursday June 7 17.00
The IBM PC and how it relates to CBM
Simon Tramner

Friday June 8 16.00
Legal Aspects of Software
A. Kelman

Friday June 8 17.00
Disk Storage
Mike Todd

Saturday June 9 16.00
Adventure Games
P Gerrard

Saturday June 9 17.00
Problem Clinic
Simon Tramner


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CAESAR
THE CAT
MIRRORSOFT
SOFTWARE FOR ALL THE FAMILY
SEE US AT THE
COMMODORE
SHOW

on-line storage, fast backup and infinite off-line capacity, a 1.13 Mbs data transfer rate and a typical access time of 10 msec, allowing 10 Mb of data to be copied in under ten minutes.

Also available is the BETA 5 with 5+5 Mb of stage and the low-cost GAMMA 5 Mb Winchester at around £1500.

Small Systems Engineering will be offering up to 92 Mb of storage in a new high-speed single and multi-user hard disk system, allowing up to 64 users to share a single drive. Capacities available are eight, 16, 25, 40, 65 and 92 Mb, and all models have integral on-line tape backup, built-in error-correction code and dynamic display of drive status, CBM DOS enhancements, including multi-user file locking and passwords, and a complete range of utilities.

With local area networking becoming a current buzzword, there'll be a lot of interest in *Dataview's* HYDRA local area network, allowing CBM 64s to act as low cost collectors of data, with an 8000 acting as overall controller.

Terminal and communications software have been added to the programs offered by *Impex Designs* with their VIDEO PAK 80 80-column cartridge for the 64, along with word-processing and an 1100-cell spreadsheet.

Of major interest to business users will be the powerful CORPLAN business simulation game running on the 64 on the main Commodore stand. Previously available only for the 8032 and 8096 business Pets, the game has been specially rewritten for the Show, employing sophisticated graphics.

Basically, Corplan allows players to assume the roles of production director, sales director, finance director, and managing director/chairman of a company manufacturing Corples (whatever they may be). They have to manage resources, plan advertising budgets and sales campaign (including keeping the right numbers of reps on the road), maintain stocks, and ensure profitability – which determines how the company's shares do on the stock market.

STIRLING RETURNS TO LE MANS

Veteran racing driver Stirling Moss will return to the Le Mans circuit, in spirit at least, when he takes on all comers in the popular game at the Games Arcade at the Commodore Show.

He will also be introducing his son, Elliott, to computer cartoon character B.J. the Bear in the new range of speaking "Magic Voice" software.

Another visiting celebrity will be Chris Biggins, from ITV's "Surprise Surprise" – and he'll have some surprises for visitors up his sleeve.



DATABASES

Precision **H69/A146**
Supersoft **A43**
Viza Software **A135/A136**

More properly described as information retrieval systems, databases are now attracting the attention of the small user, with their facility for storing, extracting and manipulating all kinds of data, from mailing lists to records and video catalogues.

Perhaps the biggest news here is from *Precision*, who will be first off the mark with software for the forthcoming 16-bit Commodore PC, a rewritten version of their already popular SUPERBASE, increasing the maximum record size from 1108 to 2 Kb in length, and the total number of screen formats in a database up to 99, 240 columns wide. Also included is a comprehensive text editor and extended Basic interpreter.

SUPEROFFICE consists of an integrated program including SUPERBASE and SUPERSCRIPT II, running on the 8096, a truly superb package at a professional price (£799.25).

Meanwhile, a number of £15 applications packages have been produced to run under SUPERBASE 64, including some for the home (birthdays, diet plans, domestic accounts), and for business. Superbase has sold over 10,000 copies in its 64 variant, and is now selling at the rate of 3000 a month.

The cartridge-based MAGPIE from *AUDIOGENIC*, £99.95 is a very powerful program, entirely menu-driven, with maximum record-size 3050 characters with 52 fields – 26 alpha and 26 numeric – plus calculator screen, menu-driven "procedure" (program) editing, and help screens on disk.

The more advanced programmer, interested in developing specialised database applications, will find virtually every facility needed in the *Calco* MASTER program, a suite of file creation modules, on a disk alongside disk utilities giving the 64 the equivalent of Basic 4. A version is also available for the 8000 and 700 series.

JCL Software have a 4K business ROM for the 8096 whose enhancements to Basic include keyboard input, screen editing, and file read/write functions.

For the less ambitious, EASY FILE £50 from *Commodore* has a maximum record size of 506 characters over two screens, maximum field-size 40 characters, three levels of password protection, ascending/descending sort, and links with Easy Script.

SPREADSHEETS

Dataview Wordcraft Ltd **B35**
Saxon Computing **A1**
Supersoft **A43**
Viza Software **A135/A136**

Surely everyone must have a spreadsheet by now, and is probably spending so much time checking out the "what if?" option that the business is fast collapsing around their ears, but still the new ones come.

Supersoft are promising us the latest version of the program that started it all, VISICALC3, while *Viza's* VIZASTAR is at last (it says here) up and running – though that's really a bit of a database hybrid with business graphics thrown in.

Supersoft will also be showing BUSICALC for the Pet and Vic and BUSICALC 2 and the 3D (linked sheets) BUSICALC 3, both for the 64.

Dataview will show their INSTA CALC/GRAPH integrated spreadsheet and business graphics programs, also available separately.

Although it could be described as either a spreadsheet, a database, or even a business graphics generator, FIGARO from *Saxon Computing* is actually a bit of all three, allowing data to be maintained and displayed in a wide range of graphic styles.

WORD PROCESSING

Dataview Wordcraft Ltd **B35**
Handic Software Ltd **D13**
Impex Designs (UK) Ltd **A65**
JCL Software Ltd **C27**
Precision **H69/A146**
Supersoft **A43**

The two big word-processing stories at the show will be *Handic's* launch of WORD RESULT, the powerful companion to Calc Result designed for the 700, with split screen window to access word processing and spreadsheet concurrently, and – at the other end of the market – the modestly-priced disk version of WORDCRAFT 64 from the originators of the program in its various manifestations, *Dataview* (not to be confused with the cartridge-based Wordcraft-40 distributed by Audiogenic).

Consider our s
professional



If you ever have to bring work home from the office you can now tackle it in a fraction of the time, thanks to our range of software.

With these inexpensive new programs you can turn a Commodore 64 personal computer into a fully-fledged business tool to improve the smooth operation of your calculations, filing and ordering or information storage.

All the programs are easy to learn and use, and all cost less than £50.

There's no more cost effective way to turn your home computer to practical use.

Practicalc 64. The complete spreadsheet for Commodore 64.

With this program your cashflow will do just that.

Flow.

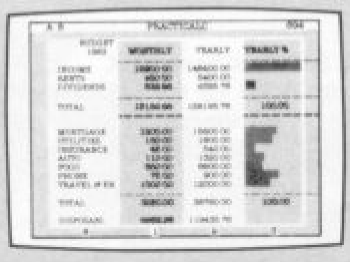
Practicalc 64 accepts both numerical and alphabetical entries and allows you to work out sales forecasts, long-term budgets, sales models or long term cash plans.

All in a fraction of the time they normally take.

Practicalc 64 has 2000 cells, more than 20 mathematical functions, (including logarithms and roots), can insert or delete rows or columns, can 'SORT' information alpha-numerically and has a 'SEEK' function to search for specific information.

It can even display the information in graph form to allow a quick visual appraisal of the situation. Disc £44.50 (Tape £39.95).

Over 20 mathematical functions. Column width up to 38 characters 2000 cells. Graph function.



Practifile 64. The database for Commodore 64.

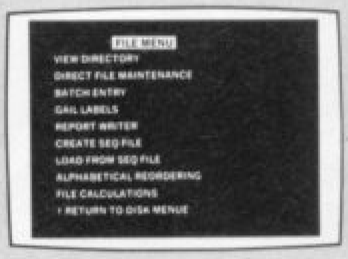
Practifile means an end to bulky and time-consuming storage of files, client or patient information or names and addresses.

And it means you'll no longer have to spend minutes or hours searching through piles of paper for a specific piece of information.

Each file on the program is able to handle 3,800 record entries, and Practifile can sort the files it contains by number or letter in less than a second.

The system is so flexible that you can add, subtract, multiply or divide within individual files, while its use with a word-processing system means that you

Sorts files by number or letter in less than one second. Fully compatible with Practicalc 64.



oftware from a point of view.



can have instant 'hard-copies' in a matter of minutes.

While Practifile means instant access to mailing lists.

At just £44.50 you won't find a more versatile, flexible and professionally useful data-base.

Inventory 64. The quick, reliable inventory system.

With its capacity of 650 items, Inventory 64 is ideal for the average small business, and means a vast improvement in the efficiency of good stock control.

All you have to do is to enter each item, followed by the information which the program will prompt.

That means things like part number, description, location, stock, year-to-date sales, re-order date, minimum quantity, vendor, list price and other important facts.

From this information your personal computer, with the help of Inventory 64, will be able to collate and assess the major points of an efficient system and be able to present you with a complete and instantaneous view of current stock situations.

And ensure that stock control problems really are a thing of the past.

Pretty good value at just £29.95.

You'll find our superb range of Commodore 64 software for professional and business use in all good computer stores including selected branches of Boots, W. H. Smith, Menzies and Laskys.

If you'd like more information about our software or require any technical help fill in the coupon or phone us on 0473 462721.

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How to get there

Hammersmith is in West London, of course, which makes the place pretty convenient from just about all directions except East Anglia and North East London. Driving there isn't too bad; the public transport services are excellent.

By car

Getting to the Cunard International Hotel can appear daunting and is the subject of numerous apocryphal stories about haggard drivers circulating feverishly around the Broadway looking for a way to it. But in reality it's not too difficult.

The main hotel entrance is in Shortlands, and that's a two-way road connecting Talgarth Road and Hammersmith Road.

Coming from Earls Court and Central London you aim for the A4 and follow signs to Heathrow, Bristol etc until you reach the Hammersmith flyover ... otherwise the next possible exit is a couple of miles further on. So get into the left-hand lane and take the side road signposted

'Hammersmith'; and at the next opportunity, turn right and make a U turn under the flyover. That puts you briefly on Talgarth Road going the other way; Shortlands is the first left.

Coming from Kensington and the West End, drive through High Street Ken and past Olympia. You're then on Hammersmith Road without trying; Shortlands is the last turning on the left before you reach the ugly kingsize roundabout at Hammersmith Broadway.

Coming from the West you stick with the A4 until you're offered the Hammersmith and Shepherd's Bush exit just before the flyover. Again, don't miss it: it's tricky to find your way back again! You follow the slip road on the Broadway, go right round the roundabout past the tube stations, and don't aim for Kensington – it might look the obvious route from the map, but there's no right turn into Shortlands from that direction. *Instead* take the next exit signposted 'Central London'. This puts you on to Talgarth Road and Shortlands is the first left.

Coming from Shepherd's Bush and the North you aim for the Broadway, avoid the temptation of the Kensington direction, and follow the Central London sign again with Shortlands the first left.

Car parking is in theory available at the Hotel itself – there's an NCP car park under it – but most of the space is likely to be taken by exhibitors and the Hotel's regular guests.

There are two other decent-sized car parks locally: one is off Queen Caroline Street (get on to the Broadway and take the exit after the Odeon), the other is behind the new shopping precinct called Kings Mall (take the King Street exit from the Broadway and follow the signs around to it – it's about five minutes' walk from the hotel).

Alternatively you might just be lucky and find a space in some side-street. Your best bet is probably in the maze of streets just North of Hammersmith Road.

By tube

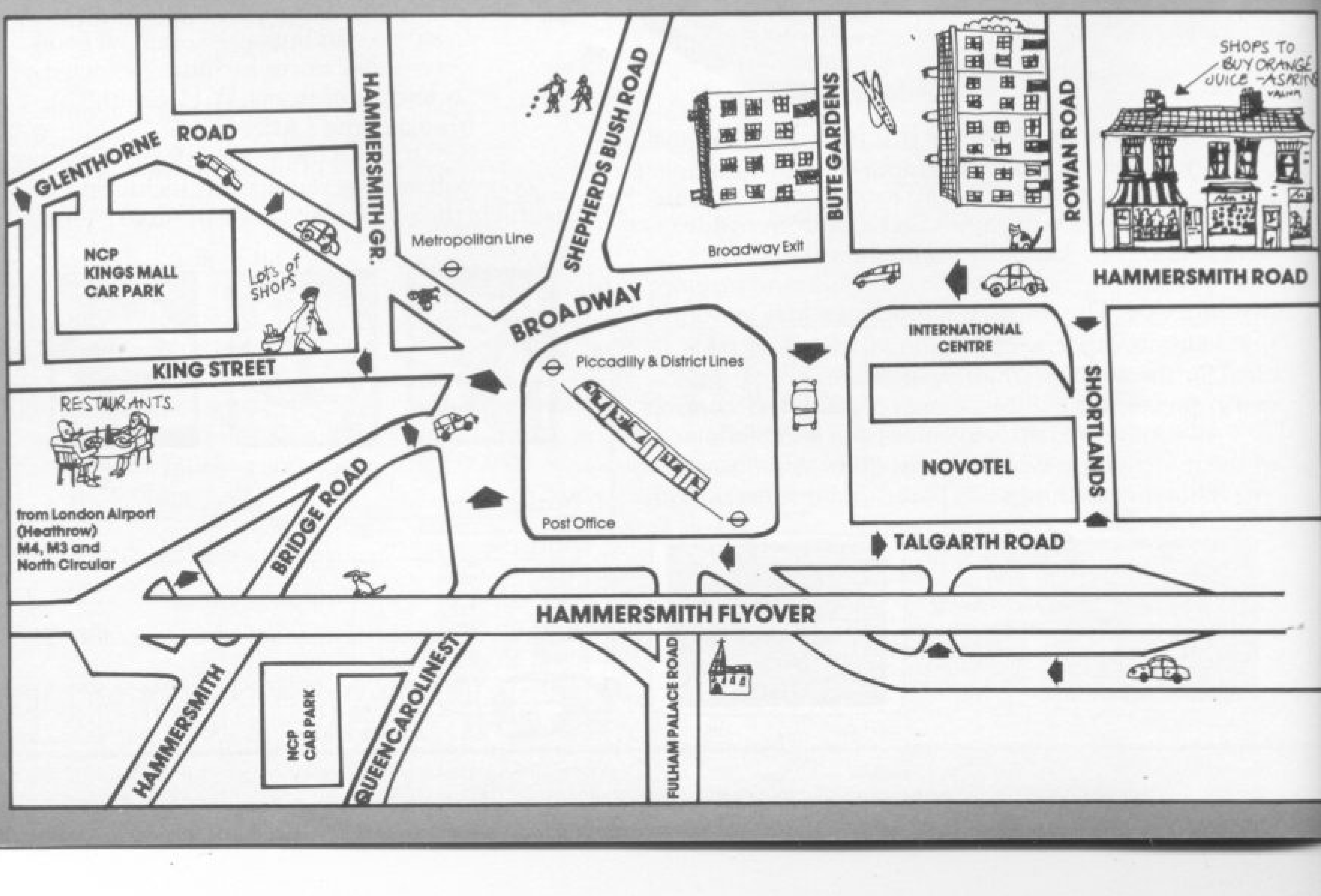
This is the obvious way to come if you live near a *Piccadilly, District* or *Metropolitan Line* station. On the Piccadilly and District Lines you look for the 'Broadway' exit from Hammersmith station, turn right past the Clarendon pub and search for the subway that gets you under the Broadway itself.

The Metropolitan Line exit is on the North side of the Broadway, so turn left and brave the traffic at the foot of Shepherd's Bush Road and try for the island of office buildings which also contains the Cunard.

Hammersmith is served by dozens of buses, too.

Leaving by cab

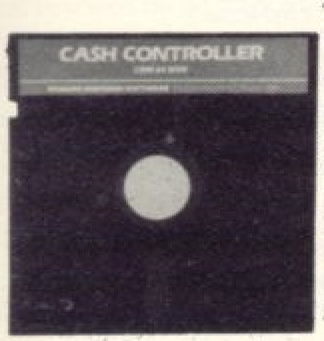
If you need a taxi, you'll probably find some at the hotel or will be able to flag one on the Broadway. But there is also a cab rank on the corner of Shortlands and Hammersmith Road, and there's another at the junction of the Broadway and Hammersmith Grove.



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- **PRINTOUT FACILITY**
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at £14.95 each 64 Disk ☐ version required
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OOPS!

When the Vic or 64 hits a problem, it puts a message on to the screen preceded by a question mark and followed by 'READY' with the cursor blinking on the line below.

Here's an alphabetical list of the error messages you might get, complete with possible explanations and what you can do about it. Where a line number is involved, that's given here as [n]: it indicates at which line in your program the error was detected, but note that this doesn't necessarily mean the error itself is actually in that line – it may have been caused by something else in the program.

Several of these messages are really obscure and definitely unlikely, some refer only to disk usage, and several involve concepts and commands that are outside the scope of an introductory look like this. But they're all here for the sake of completeness.

BAD DATA ERROR IN LINE [n]

The program was expecting numeric data and it got a character string. Correct the duff command(s); normally it's a READ or INPUT# statement followed by a numeric rather than a string variable (one with a $ sign on it).

BAD SUBSCRIPT ERROR IN LINE [n]

You're trying to reference an element in an array that's outside the dimensions you set up with a DIM statement. You'll have to correct the DIM so that the array is larger, or change the array element number so that it's within the range.

BREAK IN LINE [n]

Not exactly an error message, just an indication that the program has been stopped and what line it had reached. This is usually because you wanted it to stop (you inserted a STOP statement in it to see how it was doing so far, or you hit RUN/STOP to halt it) or because you accidentally leant on the RUN/STOP key.

CAN'T CONTINUE ERROR IN LINE [n]

You've used a CONTinue command, but the program has been deleted or perhaps amended such that program execution cannot proceed.

The most likely cause, however, is that the computer has previously picked up another error and you haven't corrected it – it won't let you CONTinue until that has been fixed. Your best option is probably to try restarting with RUN and see if that throws up an uncorrected error.

DEVICE NOT PRESENT

Probably means the device you're trying to get at (usually printer or disk, occasionally cassette) isn't connected to the computer or the mains. That's easily remedied, of course.

Sometimes though you'll get this message for no apparent reason – on my own set-up it sometimes appears when I'm trying to read a file from disk while the printer happens to be switched on. The solution that usually works is to switch off everything you can and try again; alternatively OPEN a channel to the device you want to address and then re-attempt it.

This message can also occur if the devices are powered up in the wrong order, especially if using two single 1541 drives. Experiment to overcome the problem.

DIVISION BY ZERO ERROR IN LINE [n]

The computer won't allow you to divide by zero. You might have tried to do that by mistyping something, but it's more likely to occur within a FOR... NEXT loop or as a result of filling an array with numbers that you then use in a division. The easiest solution is to put in a check for zero on any procedure that might just produce one in a division.

EXTRA IGNORED

Someone typed too much in response to an INPUT prompt. You may also have inadvertently included a comma in your input. (The comma is used to separate fields and must not be used as an input character.)

FILE ALREADY EXISTS

The computer won't let you set up two files on disk with the same name; but it won't tell you that – unless you're trying the COPY command, in which case you'll get this message. Give up and rename the file.

FILE NOT FOUND

You're trying to LOAD or VERIFY a file that the computer can't see on the tape or disk. It's probably not there; but you may have mistyped the file name or misrenumbered what you called it.



FILE NOT OPEN

You haven't used an OPEN command when the computer wants one from you – which is before a CMD, CLOSE, INPUT#. So OPEN a file and retry.

FILE OPEN

You used an OPEN command on a file that's already open. Either you don't need to re-OPEN it, or you need a different logical file number in the OPEN command. If in doubt, CLOSE the file and OPEN it again.

FORMULA TOO COMPLEX ERROR IN LINE [n]

You've asked the computer to do too much – you used an expression that has too many brackets or too many functions. Split up the expression somehow; that's good policy anyhow, since it will make life easier for anyone (like you) who has to read through and understand the program in the future.

ILLEGAL DIRECT

Most of the computer's commands can be used in immediate mode (ie they are executed as soon as you hit RETURN) or in programs (they are executed only when the program is RUN). But these are not valid in immediate mode:

DATA
DEF FN
GET
GET#
INPUT
INPUT#

If you really want to use these, you'll have to write a short program that incorporates what you want to do and RUN it.

ILLEGAL QUANTITY ERROR IN LINE [n]

You have a variable that is outside the computer's range. It usually happens when you're trying to POKE a value less than 0 or above 255. So don't.

LOAD ERROR IN LINE [n]

Something is wrong with an attempted LOAD from cassette – typically the file you're trying to LOAD has been scrambled somehow. You didn't leave the tape on top of the TV, did you?

Error messages and what they mean

There's not much you can do about this, except try again: and if it persists, put it down to experience – and take more backup copies in future.

NEXT WITHOUT FOR ERROR IN LINE [n]

The computer has found a 'NEXT' statement in your program that is not associated with a preceding 'FOR'. You might have missed out the FOR altogether, or a NEXT somewhere else in the program might have been tied to your FOR – that can happen if you aren't specific about which FOR variable you want executed NEXT. Check that your FORs and NEXTs pair off.

NOT INPUT FILE

You've OPENed a tape file for output only and you're now trying to read from it. Check your READ# command, but the fault is more likely to be in an OPEN – if the third parameter of the OPEN statement isn't '0' or omitted altogether, you have opened a write-only file.

NOT OUTPUT FILE

A tape file has been OPENed for input only and you're now trying to write to it. Again, check your READ# command; but as above the fault is more likely to be an OPEN – if the third parameter of the OPEN statement isn't '1' or '2' you have opened a read-only file.

OUT OF DATA ERROR IN LINE [n]

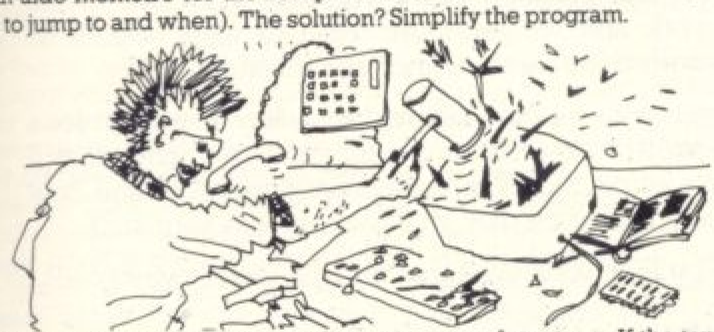
The computer has run out of DATA items to READ – there must be enough entries in your DATA lines to fill all the variables in READ statements. The simplest solution is to start counting and make sure there *is* sufficient DATA.

You might also get the problem if you want to read the same DATA more than once – to repeat it in different POKE locations or different arrays, say. Then you need a RESTORE before attempting each READ.

OUT OF MEMORY ERROR

You may have run out of memory because your program is too big and/or it's creating too many new values for variables. Buy more memory, simplify the program, or stop it producing so many new values for the computer to store.

You might also get this error even when PRINT FRE(0) shows you have a lot of memory left. In this case what's probably happening is that the stack is filling up with too many nested GOSUBS or FOR ... NEXT loops (the stack is an *aide memoire* for the computer that indicates where in the program it has to jump to and when). The solution? Simplify the program.



This can also occur when loading a program from tape. If the tape header is corrupt then it can overwrite part of the Operating System area and cause a spurious error message. Always turn off the computer before attempting a re-load if this occurs!

OVERFLOW ERROR IN LINE [n]

You have a calculation that's produced a number too big for the computer (the largest number the Vic or 64 can handle is 1.70141884 x 10^{38}, or 1.70141884E+38 as it's sometimes written: either way it's the number multiplied by 10 followed by 38 zeros). You will have to alter the program to avoid this, perhaps by changing the order in which your calculations are done. Do you really need numbers that big?

REDIM'D ARRAY ERROR IN LINE [n]

The same array name has been used in more than one DIM statement, or you are trying to DIM an array name to which you've already allocated a particular number of elements. This is likely to be the result of carelessness: for instance, have you got a DIM statement within a FOR ... NEXT loop?

It helps to keep all your DIMs at the start of the program; that way their much easier to check.



REDO FROM START

Sounds awful but isn't. It just means the wrong kind of response has been given to an INPUT prompt – the program was expecting numeric and someone typed alphabetic, or vice versa. The message will continue to appear until the computer gets the right input.

RETURN WITHOUT GOSUB

The computer has found a RETURN that isn't linked to a preceding GOSUB – perhaps because you missed out the GOSUB or inadvertently added a RETURN (in which case you can add or delete as appropriate), but more likely because the sequence of execution caused the program to fall into a subroutine. In this case, correct the program flow: a STOP inserted before the subroutine might help you find out why it's happening.

An END there should prevent the program running on into the subroutine, a GOTO could skip past it.

STRING TOO LONG ERROR IN LINE [n]

You have too many characters in a string; the maximum allowed is 255. This may have happened because you tried to add two strings together; if there's any danger of a concatenation producing an over-long string, it's worth inserting a test for length via the LEN$ function.

SYNTAX ERROR

You have used an illegal term or construction. The probable cause is mistyping – common culprits are bad spelling, accidentally hitting one character twice while typing, and too many or too few brackets. Check your program lines. And get into the habit of using keyword abbreviations – fewer keystrokes to get wrong.

TYPE MISMATCH ERROR IN LINE [n]

Your program has tried to put the wrong type of value into a variable – string characters into a numeric variable or vice versa. Change the erring command.

UNDEF'D FUNCTION ERROR IN LINE [n]

The program is trying to use a function that you haven't defined by a DEF FN statement. Define your function (and it helps to put all your DEF FNs at the start of your program).

Sometimes this error happens because you weren't actually attempting to reference a user-defined function, you've just mistyped something that the computer has detected as a function.

UNDEF'D STATEMENT ERROR IN LINE [n]

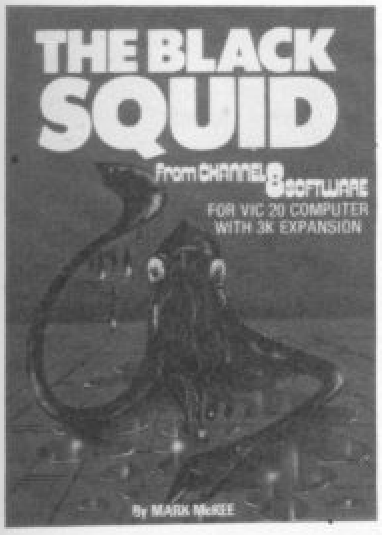
You tried to RUN or GOTO or GOSUB a line number that doesn't exist. The target line has been omitted or you got the number wrong.

VERIFY ERROR

The program you're verifying doesn't match what's in memory. There are many possible reasons for this; the best option is to SAVE it again and have another go at VERIFYing. If you are still getting a VERIFY ERROR on cassette, move the tape unit (it might be too near a magnetic field like that generated by the TV set) and/or try a different cassette.

Our regular round-up of games reviews

We get to see a lot of games here at Commodore User, so many in fact that we can't handle all the reviewing ourselves – we farm out some of them, which is why our reviews have someone's initials at the end of them. We look at everything we get, but we don't necessarily print all the reviews we write: instead, we tend to stick with (a) all the best games we come across and (b) those games that you're most likely to find in the shops or the mail order ads.



BLACK SQUID
Vic 20 (3K)
Joystick only
Price £6.95

Your shipwrecked men have to brave the unknown waters to escape the dangers of the deep.

You have to get five men to the island in the shortest possible time – which isn't so easy, for in the sea are hidden rocks which cut you to shreds if you touch them (there is a way round this: if you press the Commodore and shift key you can see the rocks). And there is the dreaded Black Squid which relentlessly comes after you with the single intent to devour your head or feet first. When you reach higher stages you also meet up with the giant clams ...

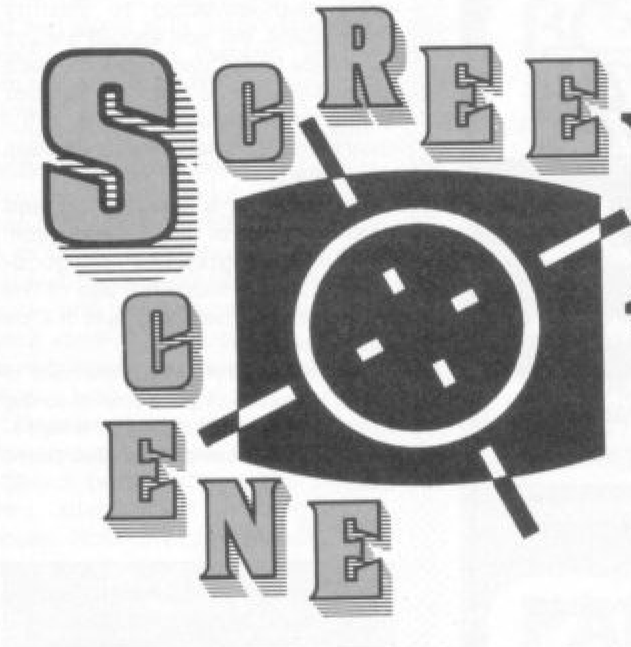
Black Squid is a very boring and difficult game to play. Trying to out swim the squid is near impossible because your men move so slowly, especially when changing direction. The graphics are reasonable but the sound is poor – a bloop-bloop noise for the chasing squid but your players make no noise at all.

On the whole a poor program.

BJ

Channel 8

Presentation: ■■■□□
Skill level: ■□□□□
Interest: ■■□□□
Value for money: ■■□□□



CENTIPEDE
Vic 20 (Unexpanded)
Joystick only
Price £19.99

This like *Defender* is an original Atari game now rewritten for the Vic 20.

In *Centipede* you are in a forest of mushrooms and you have to destroy the centipede before it can reach you; it's not as easy as that may seem.

The centipede zig-zags down the screen toward you bouncing off the mushrooms. You have a bug-blaster (just happens to look like an upside down mushroom) that is able to move up, down, left and right. Shooting mushrooms gives you a clearer shot at the centipede, but each segment of the centipede that gets hit turns into a mushroom – which sometimes results in the untimely change in direction of the rest of the centipede, so be careful when it's just above you.

There are other dangers in the forest – spiders which bounce around the screen eating mushrooms and your bug blaster; the scorpion which scurries across the screen poisoning the mushrooms (and when the centipede touches a poison mushroom it goues insane and makes a frenzied dash for the bottom of the screen); and the flea. Not as spectacular as the other two: he just drifts to the bottom of the screen leaving a trail of mushromms behind him. To destroy it you must shoot him more than once or he can destroy your bug blaster.

All round, *centipede* is a good one or two player game with well-defined graphics and good clear sound. Atari's cartridge based software for the Vic is a good idea and I am sure it will take off. *BJ*

Atarisoft

Presentation: ■■■□□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■□□

CHOPPER
Vic-20 (Unexpanded)
Joystick or Keyboard
Price £5.50

Chopper must be one of the worst games I have ever come across. The spectacular cassette insert is very misleading; with such colourful art you might expect the game to look something like it.

The so-called hi-res graphics are basic, with black figures representing a guided missile launcher, vans, trucks, tanks and the chopper. The only colour is in the ground surface and the underground missile base from where you are being constantly fired at.

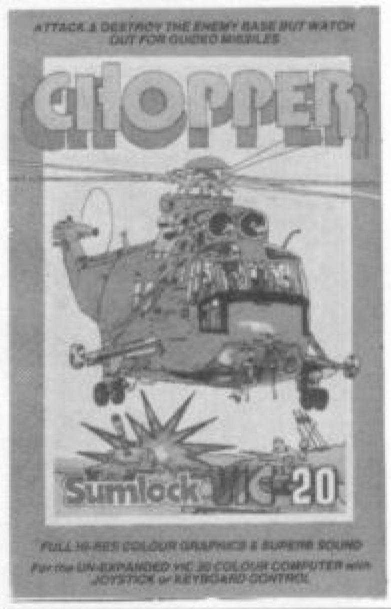
As the chopper pilot you have to bomb the passing vehicle while avoiding the enemy barrage (from the undestroyable underground base) and the guided missile (which is near impossible to outfly because it flys as fast as you and your direction change is too slow).

The game is not enjoyable at all because you can not move and fire at the same time. Poor sound, too.

BJ

Sumlock Software

Presentation: ■■□□□
Skill level: ■■■□□
Interest: ■■□□□
Value for money: ■■□□□



DEFENDER
Vic-20 (Unexpanded)
Joystick only
Price £19.99

This the original Atari *Defender*, is a zap-zap game in which you are armed with three fighter ships and three smart bombs. Your task is to prevent the alien landers from taking your humanoids. But it's not all that simple, because the landers do not come alone – they have an assortment of fiendish alien buddies such as Pods, Bombers and Baiters. The most lethal of these are the Pods: once one has been destroyed it releases Swarmers which ruthlessly track you through space with the single-minded intention of destroying you.

The Baiters only appear after a certain time. These saucer-type

Games

SCREEN SCENE

craft follow directly behind you moving at a blinding speed and contantly firing; you'll need some good manoeuvering to destroy those ships. But you should always take care in dashing through space in case you come across a Bomber laying its mines across your path – they are still active once it has been destroyed.

Defender is a fast-moving and enjoyable one ot two-player game. Well-defined graphics and good-quality sound make full use of the Vic's limited memory, and it's on cartridge too.

The main hitch with *Defender* is that it sometimes puts you on to the next screen arbitrarily; but who really minds extra points and more lives? *BJ*

Atarisoft

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□



DESTROYER
Vic-20 (Unexpanded)
Keyboard only
Price £5.50

Destroyer is another game from Sumlock, but it should not be tarred with the same brush as *Chopper*: this is a far better game.

You are the skipper of the destroyer HMS Victory. Your mission is to destroy the enemy subs in the area, though you are constantly under attack from mines and enemy aircraft. The Victory is armed with an endless supply of depth charges and two anti-aircraft guns.

The keyboard controls I found on this game give good control, especially when it comes to shooting down enemy fighters – the radar scanner tells you the direction they are coming from so you know which direction to shoot in. But watch out for bombs! You should always be on the lookout too for the mines which float from the bottom of the screen and constantly cause you to change direction. Once you have past the time limit you go on to the next screen and the speed of the game increases and so do the number of mines and bombs.

The graphics are pretty crude; the sound and colours not all that bad. But I'm sure that Sumlock could have at least disabled the Commodore and shift key. *BJ*

Sumlock Software

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■□□

HELL GATE
Vic 20 (+8 or 16K)
Joystick only
Price £6.00

Hell Gate is the oddest zap 'em game I have ever seen in a long time.

You have become the guardian of the Gate which at some point in time will be rampant with alien droids whose mission is to destroy your home planet earth.

You are equipped with four lasers situated on each side of the Gate; your task is to blast the droids as they materialise in the gate after they hyper-jump through space. Not an easy task, because there are so many of them: that's why you have four blasters. You also have 'smart' bombs, three for every wave. They are activated whenever an alien hits your blasters; once all your plasmozaps are gone you have three lives left.

Hell Gate has up to 20 levels of play; you can select your own level from 1 - 8, the rest of them you have to reach with skill. When you reach higher levels you will see 'zappers': they change colour and on turning red they release a deadly bolt that destroys anything in its path – including your blasters, so beware.

The Hi-Res graphics and sound is very good with some spectacular array of alien forms in various colours I have ever seen. Quite a good game for the zap freak, as you'd

expect from this marque. *BJ*
Llamasoft

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■■□



JUMPIN JACK
Vic 20 (Unexpanded)
Joystick or keyboard
Price £5.50

Another spinoff of that arcade favourite *Frogger*. In this Jack has been out for a night on the Lily ponds (tiles); it's now daylight and Jack has to get back home for a good day's rest. But the traffic is roaring across the road; and the river currents are flowing strongly, and would easily drown any frog that dared to cross it.

Your job is to guide a wary Jack across to his home in one piece. First you have to get him across a three-lane motorway, then you, have to negotiate the hazardous river. But help is at hand; you are aided by these white blobs with six growths (head, tail and legs) which form the turtle. There are also logs which you can hop on to as they float by until you reach home. Once you have seen Jack safely across five times you go on to the next screen and it gets harder; the cars move faster, the logs get shorter, there are fewer turtles to help you.

The graphics are fair, but the sound and movements leave a lot to be desired. The movements of Jack and the other moving parts are very jerky; the sound ... well, it plays this silly tune throughout the game which drove me to despair. On the whole a fair game, but nothing to write home about. *BJ*
Sumlock Software

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■□□

NOTE INVADERS
Vic-20 (any)
Keyboard
Price £9.25

Note Invaders is an excellent way to learn the notes on the musical staff (the five lines on which music written). It's presented as a game: these lines are produced on the screen along with particular notes which must be learned before being zapped out by the menacing 'invaders'.

There are three levels of difficulty and either treble or bass clefs can be chosen. Keyboard operation is simplicity itself, in that keys A to G represent those notes displayed on the screen. As you get faster and more accurate, the staff itself gets shorter: so you really have to know your note names well to get a high score.

Four programs are included on this cassette, at least two of which I found particularly useful in my own attempts to learn musical notes. *Note Invaders* should appeal to all ages – in fact anyone contemplating learning music or perhaps an instrument. *CB*

Chalksoft

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

THE CATCH
Vic 20 (Unexpanded)
Joystick or keyboard
Price, £3.99

If and when I acquire the necessary expertise, the two simple but neat effects employed on the title screen will be incorporated into my own magnificent programs. But enough of daydreams – what about the game?

Simplistic in concept but effective in execution: a blue saucer is dropping bombs in a quasi-predictable fashion. By moving your shield in an intelligent manner, the city – which is scrolling by beneath you – can be protected.

Subsequent to the interception of a predetermined number of pods, the border changes colour and the pace quickens. The sonics are acceptable but a bit primitive; the yellow screen is at least a change from the usual black 'space sky'

Most arcade afficionados with an unexpanded machine could find this a worthwhile bet, espe-

cially if competing against a friend.
Bubble Bus LS

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■■□□



SWORD OF HRAKEL
Vic +3K
Keyboard only
Price £5.99

Another Romik text adventure – one for the long winter evenings, I think. Your village has been depopulated by the curse of the evil Mage; you must find and kill the Mage to lift the curse and return your people. Has save-game option. Programmer has sense of humour too; I mean, what would you do with an agitated duck? Save your answers for the game! JDC
Romik Software

Presentation:	■■■□□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

XENO II
Vic 20 (+16K)
Joystick only Price £7.95

Anirog has a veritable library of 16K games. This is an early one, an epic in four screens. Screen one, in which you hopefully land on the planet Xeno II, is the most attractive. Your parti-coloured (in common parlance, half and half) red and blue craft has to dodge cyan asteroids (solid ones not sketchy outlines) and delicately alight on the landing pad.

Flip to part two: three waves of homing mines to ward off, with a brief colour display for each success. Space invaders follow; personally the aliens didn't appear menacing enough for my tastes, looking rather "dumpy". Having succeeded (after many tries) in reaching the last screen you will be faced with a monumental task. To successfully blast a way through the force field and smash the power source, shots must be directed past blockading guardians whilst avoiding the bombs released by another helpful bunch. You will certainly require practice and a fair measure of skill to triumph in the game.

The sound effects are adequate and the program will certainly give you a good work-out. LS
Anirog Software

Presentation:	■■■□□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

ZORGON'S KINGDOM
Vic-20 (+8K)
Keyboard or Joystick
Price £6.99

Not what I would call a 'graphic adventure', more a *Kong*-type game where you must get through five arcade-style screens in order to destroy the evil Zorgon. Each scenario is different, though, and it's quite a challenge overall. The graphics are quite good though though the sconics are only moderate. More difficult than it seems at first. JDC
Romik Software

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□

How to type in Victuals

How we reproduce listings

We usually put our listings for Victuals and other programs through a code conversion program that replaces the hieroglyphic Commodore colour and screen control symbols with a more meaningful set of commands.

When you see...	It means ...	And you ...
[CUP]	*cursor up*	press the 'cursor up' key (shifted)
[CUD]	*cursor down*	press the 'cursor down' key
[CUL]	*cursor left*	press the 'cursor left' key (shifted)
[CUR]	*cursor right*	press the 'cursor right' key
[HOM]	*cursor to the top lefthand corner*	press the HOME key
[CLR]	*clear*	press the CLR key (shifted)
[INS]	*insert*	press the INSert key (shifted)
[BLK]	*change to black*	press the BLK key (CTRL and 1)
[WHT]	*change to white*	press the WHT key (CTRL and 2)
[RED]	*change to red*	press the RED key (CTRL and 3)
[CYN]	*change to cyan*	press the CYN key (CTRL and 4)
[PUR]	*change to purple*	press the PUR key (CTRL and 5)
[GRN]	*change to green*	press the GRN key (CTRL and 6)
[BLU]	*change to blue*	press the BLU key (CTRL and 7)
[YEL]	*change to yellow*	press the YEL key (CTRL and 8)
[RVS]	*reverse on*	press the RVS ON key (CTRL and 9)
[RVO]	*reverse off*	press the RVS OFF key (CTRL and 0)
[SPC]	*space*	press the space bar; repeat the specified number of times

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the hieroglyphic control codes with more meaningful symbols.

These listings we generally run out on a letter-quality printer, though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes:

```
CLR            ...  ■  (REVERSED HEART)
HOME           ...  ■  (REVERSED S)
RVS ON         ...  ■  (REVERSED R)
RVS OFF        ...  ■  (REVERSED UNDERSCORE)
CURSOR UP      ...  ■  (REVERSED SHIFTED ●)
CURSOR DOWN    ...  ■  (REVERSED Q)
CURSOR LEFT    ...  ■ (REVERSED UPWARD BAR - SHIFTED H)
CURSOR RIGHT   ...  ■ (REVERSED LEFT SQUARE BRACKET)

SET COLOUR TO
         BLACK  ...  ■  (REVERSED SHIFTED P)
         WHITE  ...  ■  (REVERSED E)
         RED       ...  ■  (REVERSED £)
         CYAN   ...  ■  (REVERSED COMMODORE-SHIFTED ●)
         PURPLE ...  ■  (REVERSED COMMODORE-SHIFTED -)
         GREEN  ...  ■  (REVERSED UP ARROW)
         BLUE   ...  ■  (REVERSED LEFT ARROW)
         YELLOW ...  ■  (REVERSED PI SIGN)
THE FUNCTION KEYS CAN BE INCORPORATED INTO PRINT STATEMENTS TOO.
AS WITH THE OTHER NON-ALPHANUMERIC KEYS, THEY APPEAR AS SPECIAL"

SYMBOLS IN A LISTING
F1   ... ■                    F2   ... ■
F3   ... ■                    F4   ... ■
F5   ... ■                    F6   ... ■
F7   ... ■                    F8   ... ■
```

Scrap Yard

by A Veryard.

Scrap Yard is one of the more original and unusual Victual offerings we've seen. It runs on the unexpanded Vic and loads in two parts. The first part just lists the simple instructions. But you must load and run it, and hit run stop/restore before loading the second part. That gives you the main body of the program.

The idea is nice and simple: you are the operator of a crane which you use to pick up various pieces of junk from the assorted scrap at the left side of the screen. Pressing the space bar stops the crane above the object you've chosen. The crane picks it up and moves back automatically. You've then got to hit the space bar again to make the crane deposit the piece of scrap on the appropriate pile. There are four different kinds of rubbish, each with a different points value. If you fail, the junk you've already collected literally walks out at the bottom of the screen – and you start all over again.

The program shows good use of vertical scrolling and there are some nice sound and colour effects too – so go and pick up some rubbish.



```
*** SCRAP YARD 1 ***


1 POKE 36869,255
2 POKE 36865,160
5 POKE 36879,25
10 POKE 51,0: POKE 55,0: POKE 52,28: POKE 56,28: A=7168
20 READB: IFB>256THEN200
30 POKE A,B: A=A+1: C=C+B: GOTO20
100 DATA28,28,127,42,42,42,42,28
101 DATA255,129,129,141,129,255,129,129
102 DATA28,34,65,255,255,255,255,255
103 DATA62,63,126,254,255,119,6,6
104 DATA255,129,255,129,255,129,255,129
105 DATA31,63,118,246,246, 118,63,31
106 DATA255,255,0,0,0,0,255,255
107 DATA60,36,231,129,129,231,36,60,999
200 IFC<>8352THENPRINT "[CUD]SORRY DATA ERROR": END
210 PRINT "[RVS][GRN][CLR][SPC5]SCRAP YARD"
215 PRINT "[RVS][SPC5]──────────"
220 PRINT "[CUD][RVS][RED]YOU ARE IN CONTROL OF A CRANE IN THE YARD."
225 PRINT "[RVS]YOUR MISSION IS TO[SPC4]TIDY UP THE YARD.WHEN YOU ARE OVER SOME
JUNK";
230 PRINT "YOU PRESS THE 'SPACE  BAR' TO LOWER THE JIB."
235 PRINT "[RVS]THE CRANE WILL THEN   RETRACK ITS STEPS.[SPC4]THUS LEAVING YOU T
HE  FINAL";
240 PRINT " JOB OF DROPPING THE JUNK IN ITS[SPC8]CORRECT PILE!!.";
245 PRINT "    [BLK][RVO][CUD]G[CUD][CUL][CUL][CUL][CUL][CUL][CUL][CUL][CUL][CUL]
[CUD]@[CUP][CUL]GGGGGGGGG"
250 PRINT "[CUP][CUR][CUR]A[CUD][CUD][CUL]D[CUP][CUP][CUR][CUR][CUR][CUR]B[CUD][
CUD][CUR][CUR][CUR]C[CUR][CUR][CUR][CUR]D[CUD][CUL][CUL]EFFFF[CUP]"
255 PRINT "[RVS][PUR][CUR][CUR][CUD]PRESS ANY KEY[HOM]"
260 FORT=160TO38STEP-.2
270 POKE 36865,T: NEXT
280 GETA$: IFA$=""THEN280
285 POKE 36869,240
290 PRINT "[CLR]NOW LOAD MAIN PROGRAM"
1000 GOTO1000
```

```
*** SCRAP YARD 2 ***


5 HC=150: W=50
10 POKE 36869,255
20 POKE 36879,25
30 POKE 36878,15
40 T=7744: I=7766: S=255
50 PRINT "[CLR][CUD][RVS][BLK]╭──────────────────[RVO][RED]DCBA[RVS][BLK]╮"
60 FORZ=1TO19
70 PRINT "[CUP][RVS]|[SPC15] |[SPC4]|": NEXT
80 PRINT "[CUP][RVS]╰──────────────────[RVO]EFFFFF[CUP][CUL][RVS] [HOM]"
85 PRINT "[RVS][CUP]SCORE"SC"[CUR][CUR][CUR]HI"HC
90 FORZ=1TO2: POKE 7718+22*Z,160: NEXT
100 FORV=8136+ZTO4
105 FORZ=1TO16
106 X=INT(RND(1)*15)+1
107 Y=INT(RND(1)*16)+5
108 IFPEEK(7680+22*Y+X)<>160THEN106
109 POKE 7680+22*Y+X,INT(RND(1)*4)+1
110 POKE 38400+22*Y+X,2
111 NEXT
120 IFG<>1THENGOSUB500
125 POKE 36879,28
130 POKE 36876,255
140 FORZ=1TOW: NEXT
150 POKE 36876,0
160 GETA$
170 IFA$=" "ANDM<-4ORM=-19THEN200
180 POKE I+M,160
190 M=M-1: A=A+1: GOTO120
200 M=M+22: D=D+1: S=S-1
230 GOSUB500
240 IFD=17THENGOSUB900: GOTO1100
250 IFPEEK(I+M+22)<>160THEN540
260 POKE 36874,S
265 POKE 36879,29
270 FORZ=1TOW: NEXT
280 POKE 36874,0: GOTO200
500 POKE T+M,7: POKE 38464+M,0
```

```
510 POKE I+M,0: POKE 38486+M,0
530 RETURN
540 B=PEEK(I+M+22)
550 FORZ=0TOD
555 POKE 36879,28
560 POKE I+M,0
570 POKE 36876,INT(RND(1)*128)+128
580 POKE I+M+22,B
590 POKE 38486+M+22,2
600 FORJ=1TOW: NEXTJ
610 POKE 36876,0
620 POKE I+M+22,160
630 M=M-22: NEXT
640 FORZ=1TOA+1
650 POKE I+M,0
660 POKE I+M+22,B
670 POKE 38486+M+22,2
680 GETA$: IFA$=" "ANDM>-26THEN760
690 POKE 36876,220
695 POKE 36879,30
700 FORJ=1TOW: NEXTJ
710 POKE 36876,0
720 POKE I+M,160
730 POKE I+M+22,160
740 M=M+1
750 NEXT
760 IFM+B<>-21THENGOSUB900: GOTO1100
770 M=M+22: FORZ=1TO16
780 IFPEEK(I+M+22)=BTHEN860
790 POKE I+M,B
800 POKE 38486+M,2
810 POKE 36877,S
815 POKE 36879,31
820 FORJ=1TOW: NEXT
825 POKE 36879,25
830 POKE 36877,0
840 POKE I+M,160
850 M=M+22: S=S-1: NEXT
860 POKE I+M,B
870 POKE 38486+M,2
880 PRINT "[HOM][CUD][CUD][CUR][CUR][CUR][CUR][CUP][CUR][CUR][CUR][CUR][CUR][CUR
][CUR][CUR][CUR][CUR][CUR][CUR][RVS][SPC4]"
885 S=255: A=0: M=0: D=0: W=W-2: P=P+1: IFW<0THENW=0
890 IFP<>16THEN120
895 GOSUB900: A=0: M=0: D=0: P=0: G=0: GOTO10
900 FORZ=1TO4
910 P=PEEK(8114-U+Z)
930 IFP=160THENGOSUB950: U=0: NEXTZ: RETURN
940 U=U+22: GOTO910
950 IFU=0THENRETURN
960 FORO=(U-22)TO0STEP-22
970 POKE 8114-O+Z,160
980 FORV=8136+ZTO8141
990 POKE V,(5-Z)
1000 POKE V+30720,2
1010 FORC=1TO20
1020 POKE 36876,INT(RND(1)*128+128): NEXTC
1030 POKE 36879,25+INT(RND(1)*7)
1040 POKE 36876,0
1050 POKE V,160: NEXTV
1060 POKE 36879,25
1070 SC=SC+10*Z
1080 PRINT "[RVS][HOM]SCORE"SC"   HI"HC: NEXT
1090 RETURN
1100 I=15: FORT=38TO153
1110 POKE 36865,T
1120 POKE 36878,I: POKE 36877,255
1130 I=I-.13: NEXTT
1135 POKE 36869,240
1140 PRINT "[CLR][CUD][CUR][CUR]OH DEAR!!": PRINT "[CUD]YOUR JUDGEMENT FAILED";
1150 PRINT ",[CUD]AFTER YOU HAD MANAGED [CUD]TO SCORE"SC"POINTS"
1160 PRINT "[CUD] ON [CUD][CUD][RED]THE SCRAP-YARD!!.[BLK]"
1170 IFSC>HCTHENPRINT "[CUD][CUD]HOWEVER YOU DID BEAT  [CUD]THE OLD HI SCORE"
1174 IFSC>HCTHENPRINT "[CUD]BY"SC-HC"."          : HC=SC
1180 POKE 36865,T
1190 FORT=153TO38STEP-1
1200 POKE 36865,T
1210 FORI=1TO30: NEXTI,T
1215 POKE 36877,0
1220 PRINT "[CUD][CUD][CUD][CUR][CUR][CUR]ANOTHER GO?(Y/N)"
1230 GETA$: IFA$="N"THENPRINT "[CLR]OK!!": END
1240 IFA$="Y"THEN1260
1250 POKE 36879,25+INT(RND(1)*7): GOTO1230
1260 SC=0: P=0: M=0: D=0: A=0: G=0: W=50: GOTO10
```

commodore

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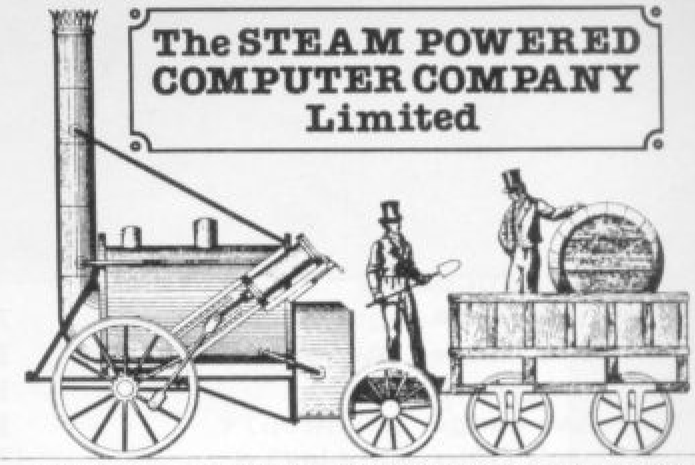
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Commodore 64 Video:

Part 6: Split screens

by Jim Butterfield

This time we'll look into a fairly advanced technique: split screens on the Commodore 64. It's a new aspect of the computer, combining things we have already learned into a new set of capabilities.

We'll need to venture into more technical waters here ... but with a little effort, we can perform some minor miracles on the Commodore 64 screen. All the limitations we have learned may be set aside with a little creative 'cheating'. We'll have to venture into machine language; but even if you're not a ML tyro, it's worth knowing that the job can be done.

We have learned a number of limitations, largely based on the idea that the screen can do a lot of things, but only one at a time:

- We can have only one background colour, unless we are in multi-colour mode; and even in that case, we're restricted to our choice of colours
- We can obtain information only from one 16K memory quadrant
- We can only use one character set
- We can be in character mode or bit map (hi-res) mode, but not both
- We may have only eight sprites on the screen at one time.

In fact, we have a more general set of rules. We may be in only one mode at a time – multi-colour is either on or off; extended colour is either on or off; and so on. It seems impossible to mix screen modes and have the best of both worlds ... but we *can* do it.

Here's the trick: the 'Raster Register', address D012 together with the high bit of D011, can do more than tell us where the screen is being painted at this instant. We may store an 'interrupt' value there, and tell the computer "Advise me when you can get this part of the screen". And at this point, we can switch screen characteristics: colour mode, high resolution, background colour, character set, memory bank ... whatever you want. Of course, we need to put it all back when we return to the top of the screen.

The Task

We're going to write a quick program to split the screen into two parts, each with a different characteristic. It won't be perfect; we're just trying to show you the technique and not polish up all the loose ends. The fine points will come later. First, let's plan.

If we set a new 'interrupt' into our machine, we'll need to make some careful distinctions. First: when an interrupt happens, we must establish who caused this one? Was it the raster, or the traditional interrupt source of 1/60 second timing? And second, if it was a raster, which part of the screen is involved – the top or the 'switch' point?

Let's start to lay out the machine language program. All interrupts will come here, and we'll need to sort them out. We'll put the program into the cassette buffer.

```
033C AD 19 D0 INT LDA $D019
033F 29 01        AND #$01
0341 F0 19        BEQ REGULR
```

The interrupt has happened and come here. Check the Raster Interrupt Bit in D019 – was this one caused by the Raster? We'll need to mask out the bit we want to with an AND. If we get nothing, it's a regular interrupt ... go there.

```
0343 8D 19 D0     STA $D019
```

It is indeed a raster interrupt, and we must shut off the alarm. We do this by storing the bit back where it came from (there's a 1 in the A register right now). Amazingly, this turns the bit off.

```
0346 A2 92        LDX #$92
0348 A0 15        LDY #$15
```

We'll prepare the registers assuming we are doing the top-of-screen work. The hex 92 is decimal 146 – the scan line that hits about mid-screen; that's where we will want the next interrupt to take place. Note that hex 92 is considered a 'negative' byte; we'll use this fact just a moment.

Now, let's see if we are correct about being at mid-screen:

```
034A AD 12 D0     LDA #$D012
034D 10 04        BPL MID
```

We look at the raster scan. If it's less than 127, we're near the top of the screen, and we don't see the "negative" byte. So we skip ahead.

If, however, we are at the middle of the screen, we'll see a 'negative' value. We won't branch. Instead, we'll fix up the registers for mid-screen work:

```
034F A2 01        LDX #$01
0351 A0 17        LDY #$17
```

Both streams join again at this point. X contains the raster location where we will want the next interrupt: if we're at the top, we want to be interrupted at the middle (hex 92); if we're at the middle, we will want to be interrupted at the top (hex 01). Y contains information on the character set we want to choose: graphics or text. Let's proceed:

```
0353 8E 12 D0 MID STX $D012
```

Place the next interrupt point into the raster register. The next interrupt will now hit at the right time.

```
0356 8C 18 D0     STY $D018
```

Place the 'character set' value – hex 15 for graphics, hex 17 for text – into the appropriate register.

```
0359 4C BC FE     JMP $FEBC
```

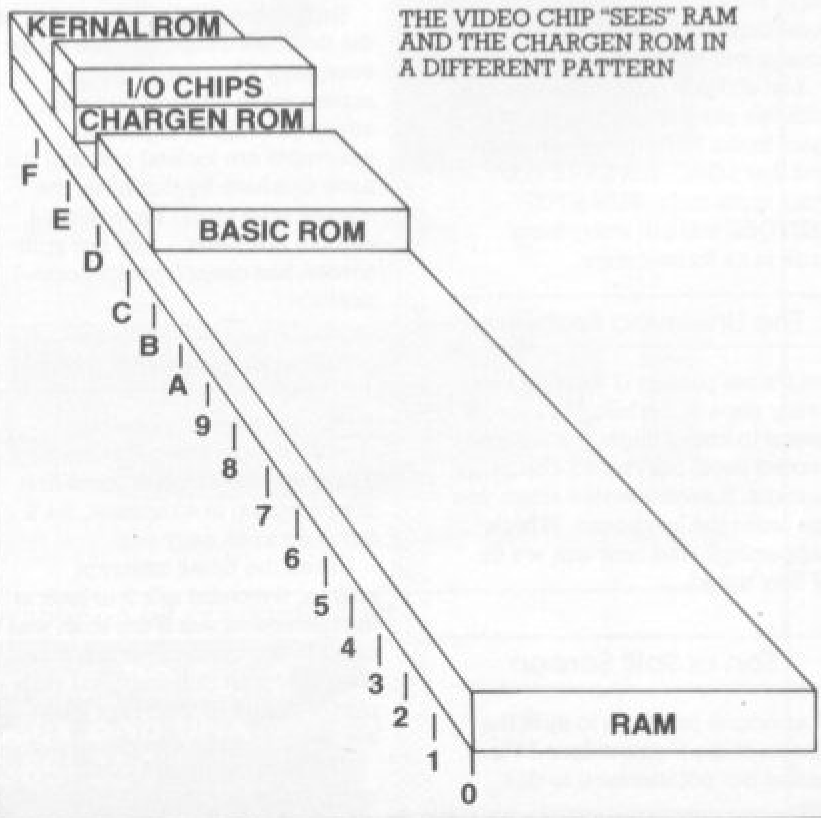
We've done our job. We may now exit. Don't give an RTI – instead, go to a routine that cleans things up nicely, at FEBC. And what of our regular interrupt? ...

```
035C 4C 31 EA REGULR
                  JMP $EA31
```

It goes to the normal address ... to which regular interrupts go.

We must have more to do after

COMMODORE 64 ARCHITECTURE



THE VIDEO CHIP "SEES" RAM AND THE CHARGEN ROM IN A DIFFERENT PATTERN

we get this program into memory. We must also detour the interrupt vector to our new program, and fire up the raster interrupt control.

Back to Basics

Ready to code all this stuff in Basic? Here we go:

```
 90 POKE 53265,27
100 FOR J=828 TO 862:READ X
110 T=T+X:POKE J,X
120 NEXT J
130 IF T<>3958 THEN STOP
200 DATA 173,25,208,41,1,240,
    25,141,25,208,162,146,160,21,
    173,18
210 DATA 208,16,4,162,1,160,23,
    142,18,208,140,24,208,76,188,
    254,76,49,234
300 POKE 56333,127
310 POKE 788,60;POKE 789,3
320 POKE 56333,129,POKE
    53274,129
```

Let's look at the last three lines. Line 300 kills the interrupt for a moment, so that we can mess with the interrupt vector without running into disaster. Line 310 changes the interrupt vector to point at our newly-poked program. Line 320 restores the interrupt, and adds an extra one: the raster interrupt.

Running it

When the program is run, an amazing thing happens: the screen becomes graphic at the top, and text at the bottom. Impossible, you say? Not for us clever (and careful) people. The effect is permanent: You may NEW the program and start something else and the split screen will still be there.

You shouldn't use cassette tape with this program in place ... it's there in the buffer. And you may find that LOAD and SAVE don't work quite right. RUN-STOP/RESTORE will put everything back in its former state.

The Unsolved Problem

But it's not perfect (I warned you). Every once in a while, the barrier seems to creep slightly and then correct itself. Maybe it's computer hiccups. It seems worse when you are using the keyboard. What's happening? And how can we fix it? Stay tuned ...

Son of Split Screen

That simple program to split the screen of the Commodore 64 is similar but not identical to this one:

```
 90 POKE 53265,27
100 FOR J=828 TO 862:READ X
110 T=T+X:POKE J,X
120 NEXT J
130 IF T<>3929 THEN STOP
200 DATA 173,25,208,41,1,240,
    25,141,25,208,162,146,160,6,
    173,18
210 DATA 208,16,4,162,1,160,0,
    142,18,208,140,33,208,76,188,
    254,76,49,234
300 POKE 56333,127
310 POKE 788,60:POKE 789,3
320 POKE 56333,129:POKE
    53274,129
```

Our previous example split the screen into two sections: graphica and text. This one splits the screen into two background colour areas. It makes it easier for us to see the glitch that occasionally disturbs our screen split. By the way, it's easier to see the problem when you are using the keyboard.

Why the problem?

Here's where the problem comes from: the timer interrupt strikes about every 1/60 of a second. The screen display runs at a rate of about 50 times a second in Europe.

The two processes run at similar *but not identical* speeds. Every once in a while the timer interrupt hits just before the raster interrupt.

The timer interrupt has quite a few jobs to do: update the TI$ clock, check the cassette motor, flash the cursor, and check the keyboard. It takes time to do these jobs, and extra time is required if a key is being pressed.

Suppose we have just started on the timer interrupt, and the raster scan says "I'm ready!" Sorry, raster; we're already into an interrupt routine, and other interrupts are locked out until we have finished. By that time, the screen scan might have moved along a few lines ... and our split screen has crept from its normal position.

Some possible fixes

There are several possible approaches to fixing this jitter. The ones that come to mind first are complex; in a moment, we'll move on to an easy one.

When the timer interrupt strikes, we could ask it to look at the raster and see if the scan was close to the interrupt point. If so, we might wait things out, or skip part of the timer interrupt jobs. Messy.

The timer interrupt could 'unlock' the interrupt very quickly, using a CLI command. That way, we could interrupt the interrupt program itself to do the split screen job. Better: but some programmers feel it's dangerous to allow this kind of thing to happen.

But there's an easier way: shut the timer interrupt off completely, and do its various jobs with our own programs. This seems very complex, but it's not. We can call the timer interrupt routines ourselves whenever it's time.

Let's look a little more closely into the timing of these interrupts. We expect to cause a raster scan interrupt about 120 times a second. That's twice as often as the timer interrupt needs to be handled. So our raster program could occasionally call in the timer interrupt program.

It seems that we could do the job easily by calling the timer interrupt routines every second raster interrupt. That would certainly do the job ... but there's a better way.

Even though we've shut off the timer interrupt, it's still signalling when the time is ready. Let's review: the timer leaves a signal in hex address DC0D (56333) whenever it counts down to zero. Normally, this signal triggers the interrupt line (IRQ) and causes the processor to be interrupted. But we may break the connection between the timer signal and the interrupt line. In this case, the timer will not cause an interrupt – but the signal bit will still flash when the appropriate time has come.

So here's our plan: we will disconnect the timer from interrupt, and service it ourselves when it flashes. Easier done than said. Let's look at the machine language coding:

```
033C A9 01 INTR   LDA #$01
033E 8D 19 D0     STA $D019
```

Raster interrupt is now the only game in town, so we don't need to test for it. We must, of course, turn off the raster interrupt flag.

```
0341 A2 92        LDX #$92
0343 A0 06        LDY #$06
```

Set up for top of screen. Next interrupt, line 92 hex; new colour, number 6.

```
0345 AD 12 D0     LDA $D012
0348 10 04        BPL MID
```

If it's really the top of screen, we can skip ahead. Otherwise, we change for mid screen – line 1, new colour, number 0:

```
034A A2 01        LDX #$01
034C A0 00        LDY #$00
```

Now we're ready to do the job,



wherever the screen is:

```
034E 8E 12 D0 MID STX $D012
0351 8C 21 D0     STY $D021
```

The job is done. Now let's see if the timer interrupt is calling for action:

```
0354 AD 0D DC     LDA $DC0D
0357 29 01        AND #$01
0359 F0 03        BEQ SKIP
```

If we don't skip, the timer wants attention. Call it in:

```
035B 4C 31 EA     JMP $EA31
```

If we did skip, the timer isn't needed. Quit with:

```
035E 4C BC FE SKIP JMP $FEBC
```

We must remember, of course, to turn off the timer interrupt, set the IRQ vector to our new code, and turn on the raster interrupt. We'll do all that in Basic. Speaking of which ...

Basic-ally Yours

... Here's the same program in Basic.

```
 90 POKE 53267,27
100 FOR J=828 TO 864:READ X
110 T=T+X:POKE J,X
120 NEXT J
130 IF T<>4077 THEN STOP
200 DATA 169,1,141,25,208,162,
    146,160,6,173,18,208,16,4,
    162,1
210 DATA 160,0,142,18,208,140,
    33,208,173,13,220
220 DATA 41,1,240,3,76,49,234,
    76,188,254
300 POKE 56333,127
310 POKE 788,60;POKE 789,3
320 POKE 53274,129,
```

Now we have a rock solid colour change at the appropriate screen point. No creeping, no jittering, no hiccups.

Summary

We've only touched upon the techniques of raster interrupt. A whole host of new possibilities open up with its use.

But we've shown it can be done ... and some of the techniques that can be used to do it.

More on sprites.

The sprite that we drew in part 3 (February issue) wasn't very big. Here's a way to make it larger in the X and Y directions with addresses 53277 and 53271 respectively.

These addresses are often used together – when an object is drawn bigger it looks closer, and we often see this effect in games and animations. Try, separately or together, POKE 53277,1 and POKE 53271,1.

Colouring

Our sprite is one colour only – the colour we selected in 53287. The other colour is 'transparent', so it isn't really a colour at all. We may code our sprite in four colours (or three plus transparent, to be exact); but we would need to draw it slightly differently.

Instead of one bit representing either 'colour' or 'transparent', a grouping of *two* bits will be needed to describe four conditions – the sprite colour (as before), special colour no. 1, special colour no. 2, and transparent. These extra special colours, by the way, are kept at 53285 and 53286. They are the same for all sprites; only the sprite colour is individual.

Now we come to the last two registers, which tell you about collisions. PEEK(53279) will tell you if any sprites have collided with the background since you last checked. It certainly has, of course, if you've been messing around with the screen as suggested.

PRINT PEEK(53279) will yield a value of one: checking the bit table above tells us that sprite zero has hit the background. Now: checking this location clears it ... but if the sprite is still touching some of the screen text, it will flip right back on again. Move the sprite to a clear part of the screen. PRINT the PEEK again – it will likely still say 1, since the sprite has hit characters since it was last checked. If the sprite is safely in a clear screen area, the next PEEK will yield a zero.

We've only activated one sprite, so that we won't see any signs of collision between sprites. You would see this in location 53278, but right now PEEK(53278) will yield zero – unless you *have* activated more sprites, there would not have been any collision. Again, when you get a signal here, you'll know which sprites have bumped; and testing the location clears it, so that only new 'touches' will be shown on the next test.

A small comment: these two PEEK locations are marked 'interrupt'. Yet when such collisions occur, they are logged – they don't do anything. Now, the word 'interrupt' has a special meaning to machine-language programmers; and no interrupt seems to be happening. The machine-code programmer who wants interrupts to happen must enable the interrupt by storing the appropriate value into address D01A hexadecimal – and then write the appropriate extra coding to make it all work.

This completes our roster of registers; but the plain mechanical facts don't convey the remarkable things that you can do with the Commodore 64. There's more to come ...

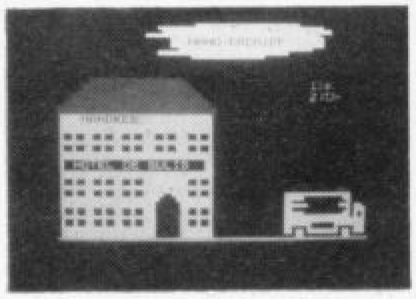
A mind to learn?

Sulis Software has a home education program for you..

ENGLISH

BAILIFF

Age guide 14 to adult.
Content: 1300+ words with difficult and confusing beginnings and endings. These prefixes and suffixes cause great problems, and the only way to learn them is practice.
Before you begin, you are tested to assess your level, and you are scored on the basis of this. You have to work at the spelling until you reach 100% on every round.
The game—every time you spell a word right, a guest arrives at your hotel. A mistake, and you lose a guest. If you lose too many, the bank calls in the bailiffs. If you do well, you move up to a better



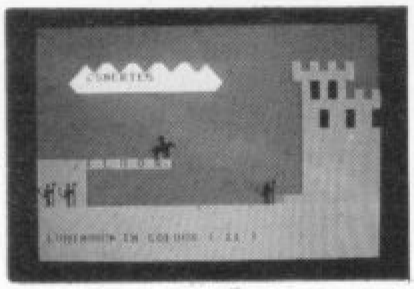
hotel.
Bailiff also has a practice option (you select the words you want to study, and work through them without playing the game); an analysis of mistakes; and a survey of words in each section.

BESIEGED

Age guide 15–Adult, for advanced spelling.
Content: 480+ words which are difficult to spell because:

- they have unusual consonant or vowel clusters
- they are of Latin or Greek origin
- they are technical.

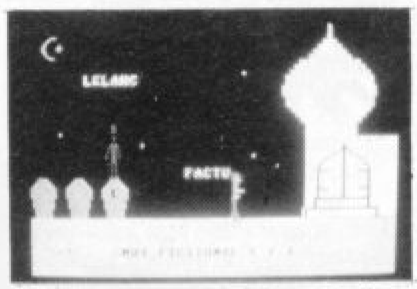
You have to recognize each word from the definition and then key it in correctly. Each correct word means a knight can cross the bridge and go into the castle. Every mistake helps an infidel to



reach the castle. After three mistakes, the castle is lost to the infidels. There are different levels of difficulty, and the words come up randomly, so that no two rounds are the same.

OPEN SESAME

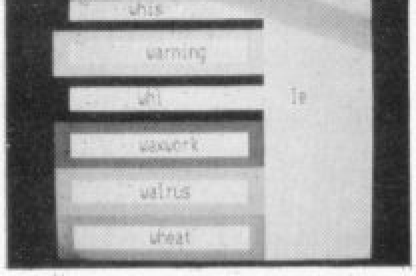
Age guide 13+
Content: 480+ words which are commonly used but often misspelt because of subtleties like doubled consonants, words with the same pronunciation but two spellings and meanings—such as 'principle' and 'principal'—or words whose pronunciation is no indication of spelling.
The action is set in Baghdad. Ali Baba is trying to get at the treasure in the cave, but it's a difficult task. Even if he gets a group of words right and escapes the bandits who want to kill him, it takes many rounds to get to the final spell which reveals the



treasure. It's worth it, though—by the time you can get fifty words right, with only two mistakes, you know that your spelling has improved.
Open Sesame has definitions of the words, jumbled-letter clues, and a choice of level of difficulty.

STARTER and JUNIOR WORD SPLITS

Age guide: 4+ and 8+
These two word games both use the same techniques, but with different words—concrete words for younger children, grouped under subject for easy understanding; more complex words which are difficult to spell for older children. Word Splits helps children with their spelling and vocabulary in a lively and original way.
The aim is to join the split words to their other parts. Six split words appear on the screen, and you have to shoot in the right match to make complete words. It sounds easy, but it's great fun, and there

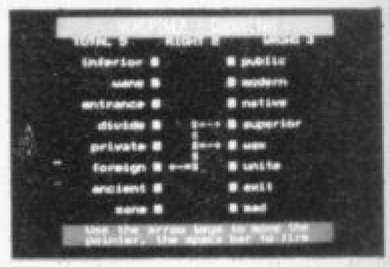


are enough words (250 in Starter Word Splits, 500 in Junior Word Splits) to give hours of pleasure and learning.
These games are designed to be very easy to use, and even 4 year olds can manage perfectly well by themselves once the program is running.

ENGLISH

WORDPOWER

Age guide 11+
Content: 1200+ words in five sections: synonyms, similes, collectives, nouns and their adjectives.
The purpose of Wordpower is to expand vocabulary and improve spelling. Most people suffer from a 'restricted code'—they use the same words and sentences again and again because they don't know how to say or write the same thing in different ways. Wordpower enriches your use of language by showing you alternatives and

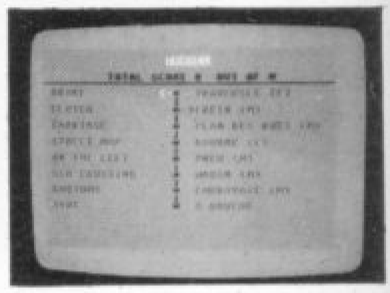


making you use words accurately. Start with one of the two games—'Lines' is easier than 'Shooting', and then when you are sure you know the words, get the spelling right with the writing option.

FRENCH

JUST A MOT

Age guide 13 to adult
Content: 500 French words arranged in five groups: Food and drink, Shopping, Travel, People and Essentials.
Just a Mot consists of two games and a writing option. Use the games to get familiar with these useful, idiomatic words. Then make sure you really know them by selecting the key-in option. You can work from English to French or vice versa—and the choice of speeds means that once you know the words, you can really build up fluency. No more long pauses while you try to think of a suitable word! And you needn't have any worries that these words are the usual English classroom ones

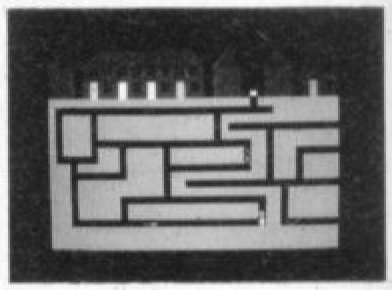


which are either plain wrong or so peculiar that no French person would ever use them! Our programs are vetted meticulously by native French speakers. Just a Mot provides an excellent vocabulary for holiday or business travel, for students or for people who just want to brush up their half-forgotten French.

HISTORY

TIME TRAVELLER

Age guide 7 to adult
A romp through five major periods of English history. It questions you on each age, and then lets you loose to be chased by wild beasts (in the Bronze age), legionaries (Roman Britain), priests and prelates (11th century), palace guards (16th century) and germs and rats (in a 19th century sewer). You have to amass a huge score to get back to the 20th century, so after progressing through the ages in chronological order, you are allowed to choose your age to go



back and get more points.
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Three machine-code pages

UF 6502, Osirisan and Mikro in competition

by David Bolton

In an earlier article I looked at several different packages for writing machine-code programs on the Vic. Since then the software writers have been busy, and some new programs have come my way. This time I'll be looking at one for the Vic, one for the 64 and one that's available for both machines. And along the way I'll indicate what I (and, by suggestion you) would/should look for in such products.

The packages I'll be examining are **User-Friendly 6502** by a Syd Pidd which is an alternative to assembly language: Elmhirst's **Osirisan** for both Vic and 64: and **Mikro** by Supersoft for the 64 – although I reviewed Mikro for the Vic in that earlier article there have been enough changes to make it worth a fresh look.

User Friendly 6502

User-Friendly 6502 (UF for short) is a rather unusual product. Quite frankly when I first saw it I was appalled by its presentation: to say that it is amateurish would be rather understating the case. This could be an early review copy (*it was – Ed*) so I'll give it the benefit of the doubt and assume that the manual will be typewritten in future!

The idea behind UF is sound enough, though – many people are bewildered or scared of 6502 machine code. So the author has invented an intermediate language between Basic and assembly code. Instead of writing programs in conventional assembly code with mnemonics like *STA $DC0D, LDA (247),Y* or *LDA £$FE* you enter statements such as *M56333=A, A=ZY247* and *A=254*.

I found the instructions rather confusing, but that may have been because I know assembly code already – rather than a beginner, who wouldn't. But '*A=ZY247*' seems a little awkward, as do most of the mnemonics which are used with the index instructions. (Index instructions are similar in concept to using arrays in Basic.)

The manual supplied was 21 pages long – and all hand-written, which put me off a bit. The first 15 pages give examples of small programs; the last six are reference tables.

Two versions are supplied on tape, for unexpanded and 8K+ Vics. The expanded version allows labels to be substituted for absolute addresses, but as labels aren't explained it could all get a little confusing for the beginner.

To be fair to the writer who has obviously spent some time in preparing this, UF 6502 has the germ of a good idea: but it needs a lot of revision and a much more detailed manual with plenty of commented examples. The program is fine but the best program in the world is only as good as its documentation.

I have not seen this product advertised, so I do not know whether it is on sale anywhere (mail order only – *Ed*). My advice? Stay clear until a completely revamped version is brought out.

Osirisan

Osirisan is rather a different product, an Editor/Assembler package. The name is a bit strange – reminds me of disinfecting fluid: perhaps there is a connection with getting rid of bugs! It has been written by Elmhirst Enterprises and runs on Vic or 64 – it requires an 8K expansion if you have a Vic.

It is supplied in either cassette or disk format (£19.95 or £22.95); and there is an upgrade available if you move from cassette to disk, or Vic to 64, at a cost of £9. The version of Osirisan I received came on disk.

There are two machine-code programs: FREDIT and ASM. FREDIT is a text editor which is used to create the source program; ASM then converts this to machine-code.

There are several versions of these programs supplied, differing only where they load and run. If you expand your Vic memory you might use ASM 6, which loads in at 24576: or even ASM A which is sited at 40960 (an odd address because it is the cartridge space though if you have a special RAM card – of the type used to copy cartridges – you might use this version. Perhaps a later version will be brought out in ROM).

Normal ASM loads at 4608 as does FREDIT, but there is also a composite ASM EDIT which is both programs – you would need a 16K expansion on a Vic to use this.

The 64 versions of ASM load in at 2049 and 32512; FREDIT and ASM EDIT both load at 2049. These programs relocate themselves when RUN.

My own preference is to use ASM EDIT on either machine if the memory is available, as that way you don't have to keep on repetitively loading FREDIT then ASM.

The editor

FREDIT is a full screen editor which is a bit like some of the better word processors: the screen acts as a window into the full text and scrolls horizontally as well as vertically and it can be scrolled left or right to give a maximum width of 230 characters.

FREDIT offers a set of comprehensive commands which allow you to search, replace, move, copy and delete blocks of text. The editor works in two modes: menu and editing. From the menu you can do directories, set markers, move to the top or bottom of the text, and save or load text files. When you press the space bar you get into the source and can type in new lines, delete old bits, and do general editing. The function keys let you move quickly up or down through the source.

There are a few points here that I think might be improved on; for instance search and replace needs about five keystrokes per replace and this can get quite tedious. And the documentation for FREDIT is a little sparse – just a list of commands and general operating information.

My main complaint though lies with text copying, which has to be done via disk or cassette: it would have been much better if it could work in RAM as well. It might be a little slow if spare memory is on the low side, but it must surely be faster than disk or cassette.

When you have finished editing, you should save the source out with a .SRC extension so that ASM can recognise it. It's a pity FREDIT doesn't add this automatically. Saving isn't strictly necessary, as ASM can pick up source from RAM directly: but it's a wise precaution in case your program should bomb out when you run it.

The assembler

The start and end addresses are given when you exit FREDIT. These should be noted when you load ASM unless you wish to assemble from disk or cassette.

From experience I prefer to have the editor, assembler, source and object code all in memory at once. Obviously this

may not be possible for large source files or low-memory systems. But it is a credit to Osirisan that it allows you to store source code in RAM or disk or cassette and also *assemble* into RAM or disk or cassette.

When you run ASM it works completely off the functions keys. F1 starts an assembly by asking you for the filenames. This serves a double purpose: it identifies the file on disk or tape, and the suffix you add tells ASM where to get the source and where to send the machine code and listing file.

The suffix is made up of a full stop and three characters – many computers use this system. The first letter indicates where the source comes from – it can be **B**, **M**, **K**, or **U**, for **B**ulk storage device (disk or cassette), **M**emory, **K**eyboard, and **U**ser-written device.

That last one would allow you to use any fancy storage devices you get running on your machine (Winchester disk? Micro-drive?): but you'll have to write your own input and output routines first – certainly not a task for a beginner.

The second character indicates where the assembler listing goes, the third specifies the destination of the machine code. The same input options apply, but in addition you can send to the printer (**P**) or discard completely (**Z**).

With a source file name like PROG.BSM the assembler will pick up the file PROG.SRC from disk or cassette (whichever you specified when you bought the system), list the assembly on the screen and put the machine code in RAM: a name like PROG.MZM will assemble from RAM without listing and put the code back in memory.

This is about the fastest way of producing code, and is fairly quick – I assembled a large source program (about 15K) in memory taking 37 seconds without producing code and 35 seconds with code. It is just a little slower when not producing any code.

If the code is assembled to disk or tape, it is sent out in hex format (Commodore assemblers do the same). It must be reloaded as machine-code and then saved out.

The other function keys let you examine disk directories and erase disk files as well as loading text and hex format files, saving out or running machine code programs, and exiting to Basic.

If you have an ASM EDIT loaded, to get from the assembler to the editor you press F5 (execute machine code) and enter either '2900' (cold start – wipes all text) or '2903' (warm start – preserves existing text). I didn't like this aspect of Osirisan; there should be a better linkage between the two programs – perhaps allowing the assembler to pick up the text address when you assemble from RAM.

Once you have entered the values it needs (where the source starts, where the symbol table should be built), these are retained as a default and used subsequently if you just press return.

A wide range of directives and pseudo-ops are available, so that you can control the format of assembler listings and link big source files if they won't all fit into memory at the same time.

Apart from my complaints about the search and replace facilities, I can fully recommend Osirisan to anyone who wants to write machine-code programs. The only significant omission is the ability to relocate machine code to a different address. At about £20 it is good value for a professional product.

Mikro

At £57.75 Mikro is nearly three times the price of Osirisan. But if you want the luxury of a cartridge assembler which works with Basic it is certainly worth a look.

The Vic version is not just an assembler: it also has commands for graphics, sounds and joysticks. These have been dropped in the 64 version, which is purely a machine-code development system.

Unless you have a motherboard the Vic version gives you only 3K to play with – on the 64 you're left with 30K when you switch on.

Mikro works at Basic level, so you enter the source programs as lines the same as entering Basic programs. You can write and run Basic programs with Mikro plugged in: but you cannot mix Basic and source program lines. A typical chunk of source code looks like this ...

```
4400 NTK CMP £101
4410 BNE NONE
4420 JSR CHECKX ! CHECK
     HORIZONTAL MOVE
4430 BNE DONE
4440 LDA £0
4450 STA MTAB+4 ! SET UP
     DIRECTION
4460 LDA £1 ! VERTICALLY
     UP
4470 STA MTAB+5 ! ALSO X
4480 DONE RTS
```

If you want to change any of it, you can simply *list* the appropriate section and change it as you would with a Basic program.

All Basic commands work as normal, and apart from the reduced memory you'd hardly notice that Mikro was there. I like to keep it plugged in permanently, buit there are some games which just won't run with it in: I wrote this review using Easyscript which also has an aversion to Mikro.

There are several extra commands provided in Mikro to make life a lot easier. For instance, FORMAT is identical to LIST but the listing comes out very nicely lined up in columns. So FORMAT 4450-4480 would produce ...

```
4450          STA MTAB+4
            ! SET UP DIRECTION
4460          LDA £1
              ! VERTICALLY UP
4470          STA MTAB+5
                        ! ALSO X

4480 DONE RTS
```

Programs can also be listed to the printer by doing an OPEN, CMD and FORMAT. A Centronics parallel printer interface is built in (programmed in software) so you can plug a printer cable directly on to the user port as device no. 6 – it can be used from Basic with OPEN 1,6 instead of OPEN 1,4. Very nice indeed.

DELETE is a much-needed command which removes lines of program. But I think there's a bug in it: if you delete from a line to the end of the program ('DELETE 4450-' say) this seems to corrupt the end of the program.



The solution is to specify a range of lines instead.

There is also a known bug in the current version (no. 3) of Mikro – if you enter a line including pi (shifted up-arrow) the machine jumps into TIM – the machine code monitor – and crashes. Once it locked up my machine entirely and I had to switch off.

Other commands are AUTO, which displays line numbers when you are entering the program; and NUMBER, which shows any number (0 to 65535) in decimal, hexadecimal, octal (who uses that nowadays?) and binary. You can type in NUMBER $A000 and this will show ...

```
$A000 40960 @120000
%101000000
0000000
```

All commands can be shortened like normal Basic commands (F shift O for FORMAT, A shift S for ASSEMBLE, and so on).

TIM is an extended version of the machine-code monitor which most Pets come with. It has commands for searching, moving and disassembling machine-code programs as well as entering, saving and loading them. If a BRK instruction is ever executed, then TIM is also entered (try SYS 2).

Of the extra commands the most useful is DISASSEMBLE – this has also been provided as a Basic command. Type 'D Shift I $E456–' and it disassembles from $E456 onwards, stopping after every page until you hit space or run/stop.

The most important part of Mikro is of course the assembler – and it is quick. One utility program I have is 19K long: Mikro assembles this into 2200 bytes of machine code in 14 seconds.

The assembler works in three passes, first checking syntax and labels and then producing machine code. It generates the code very cleverly by writing it into the RAM beneath the kernal ROMs and I/O chips; when complete the code is copied into your specified area. In this way all 64K of memory in the machine can be used.

The symbol table which holds all labels can be up to 12K long and is partly stored under the Basic ROM. It would be a very unusual program, perhaps one in several linked parts, which would overflow this – the capacity is approximately 1500 labels of six characters each.

(Osirisan can assemble into the ROM as this will go into the RAM beneath, but you have to use the normal RAM for the symbol table – and don't go near the I/O page or a crash will swiftly follow.)

The LNK command allows one source program to chain another in on the end of it. This would permit very large sources to be assembled in one go – perhaps as much as 100K. But it would be very slow with three loads of each program (one per pass).

The assembler mnemonics are standard 6502 format. The usual BYT, WOR and TXT pseudo-ops allow tables of values or strings to be set up in RAM. BYT however is a little restrictive as you cannot mix long text strings with numbers on one line. A line like '.BYT 45, "HELLO", $0D' (which Osirisan and Commodore allow in *their* assemblers) has to be split over three lines ...

```
BYT 45
TXT "HELLO"
BYT $0D
```

Or else you could use the equally clumsy 'BYT 45, 'H,'E,'L,'L,'O,$0D'. It would be useful if Mikro would allow a mixed line.

Only one error is detected when assembling. So if you type in a large source with a few syntax errors, it will take a little bit of time to identify and remove them all. The error messages are given as in Basic, and you can immediately list and correct the offending line.

After a successful assembly the TABLE command will list out all the symbols and their values in alphabetic order. It is intelligent enough to output these in four columns if you do a CMD to list it on a printer.

There are some annoying omissions in Mikro, and those you'll have to rectify yourself. Renumbering is vital if you are moving or inserting new lines and is not very difficult to program as only two bytes have to be changed in each line: it should have been included as a command. Search and replace are not included either, though the FIND command will locate and list all the lines for any string you specify.

Being able to have multiple statements on a line would be a good way of getting much more text into the limited 30K memory. There is an overhead of five bytes per line, so '10 TYA' takes eight bytes rather than four (three characters plus terminator).



I had to write a small package to supply renumber and disk commands as Commodore's DOS wedge stops Mikro correctly assembling. But I've been using Mikro for several months now and it is my favourite (over Osirisan) by just a whisker.

Mikro is not cheap when compared with Osirisan or even Commodore's own Assembler Development package (£25.00): and it cannot assemble to disk or cassette. Its main advantage is speed and convenience – there is no need to muck about with separate editors and assemblers.

Under review	UF 6502
Description:	Assembly language for Vic
Supplier:	(mail order from) Syd Pidd
Address:	Alne, York YO62 2LQ
Summary:	Interesting idea, but desperately needs better presentation
Price:	£12

Under review	Osirisan
Description:	Editor and Assembler for Vic +8K or 64
Supplier:	Elmhirst Enterprises
Address:	99 Porchester Road Hucclecote Gloucester
Telephone:	0452 64938
Summary:	Only one serious cavil – but professional and good value
Price:	£19.95 (cassette) or £22.95 (disk)

Under review	Mikro
Description:	Editor and Assembler on cartridge for 64
Supplier:	Supersoft
Address:	Winchester House Canning Road Wealdstone Harrow Middlesex HA3 7SJ
Telephone:	01-861 1166
Summary:	Needs RENUMBER, but very convenient and well presented – recommended
Price:	£50.00

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CALC RESULT EASY (r49.95) - Single page version
EASYCALC (d75.00) - Standard feature s/sheet
MULTIPLAN (d70.00) - Dollar sign version but cheap
MULTIPLAN 64 (d95.00) - Outstanding features. VG
OMNICALC (d55.00) - Standard feature spreadsheet
PRACTICALC 64 (d40.00 c35.00) - Good value s/sheet
PROGRAMMABLE SPREADSHEET(d61.00 c56.50) - As above

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[] BUDGETEER d10.95 c8.95 - 40 specified categories [] CHECK EASE d25.00 c21.50-Multiple cheque account [] CHECKBOOK MANAGER c14.95 - Chequebook records [] ELECTRONIC CHECKBOOK d18.00 c18.00 - Cheque recording/sorting/balancing system, links to Money Manager [] HOME ACCOUNTANT d52.50 - Probably the most adaptable/powerful home finances program for the 64 [] HOUSEHOLD FINANCE c21.00 - Enter/update, sum/display, budget/actual your income & expenditure [] MONEY MANAGER c9.99 [] MONEY MANAGER c18.00 -Links to Electronic Checkbook [] PERSONAL ACCOUNTANT c25.00

Utilities

1541 BACKUP (d13.00 c11.00) - Duplicate your disks
64 DOCTOR (d17.35 c15.50) - Hardware fault-finder
64 SPRITE EDITOR (c5.00) - Design MOBs/sprites
ACOS+ (c8.95) -Adds 36 commands, directory feature
ADVERTISER (c6.99) - Use your 64 for point-of-sale
ARROW (r43.00) - Rapid LOAD/SAVEs plus TIM monitor
ASSEMBLER DEVELOPMENT (d24.95) -Assembler+monitors
BC-BASIC (r50.00 d22.95 c19.95) -vg BASIC extender
CENTRONICS INTERFACE (c7.95) -For parallel printer
CHARTPAK-64 (d24.95) - Bar charts and pie graphs
CHIPMON (d15.00 c12.50) - (Dis)Assembler + monitor
CODEWRITER (d85.00) - Generates BASIC program code
COMPACTOR (d10.50 c8.50) -Removes REMs, spaces,etc
DISCO (c9.95) - Tape-to-disk transfer (automatic)
DISKEY (d36.00) - Multifunction disk editor. Vgood
DTL-BASIC COMPILER (d99.50 c40.00) -It's excellent
GAMES DESIGNER (c11.50) -Design your own m/c games
GRAPHICS DESIGNER (d19.95) -Versatile graphics aid
GRAPHIX 64 (d12.50 c10.50) - Hi-res plot/fill/etc
HESMON 64 (r29.00) -Multifeature monitor utilities
JIGSAW (d7.95 c5.95) - Modest assembler package
LABEL PRINTER (c5.95) - Stores name & addresses
MAGIC VOICE (r50.00) - 255-word speech synthesizer
MASTER 64 (d69.00) -Extensive toolkit +85 commands
MASTERCODE ASSEMBLER (d24.00 c14.95) -vg assembler
MIKRO ASSEMBLER 64 (r55.00) -Best assembler for 64
MON 64 (r39.50) - Full feature monitor utilities
MONITOR (r29.95) - Includes Centronics interface
PETSPEED 64 (d50.00) - vg four-pass BASIC compiler
POSTER PRINTER (c5.99) -Produces large characters
PRINTLINK 64 + cable (dc30.00) - All you need. VG
PROGRAMMERs UTILITIES (d14.99) - Twelve programs
QUICK-CHART (d8.95 c6.95) - Bar chart generator
RENUMBER (d9.50 c7.50) - Full renumber facility
SCREEN GRAPHICS (d14.95 c12.95) - Adds 20 commands
SIMONS BASIC (r50.00) - 114 extra commands/toolkit
SIMONS BASIC II (d14.95 c9.95) - 84 extra commands
SIMPLY ASSEMBLE (dc25.00) -Inc conversion to BASIC
SOFTWARE AUTOMATIC MOUTH (d42) -Speech synthesis!!
SPRITE MAKER 64 (c6.95) -Very good sprite designer
SPRITE AID (d8.95 c6.95) - Sprite/MOBs designer
SPRITE/GRAPHICS EDITOR (c5.99) - For sprites/UDGs
SUPER DISK UTILITY (d12.50) - Multifeature utility
SUPERSORT 64 (d25.00 c23.50) - Fast sort routine
SUPERFONT 4.0 (c6.95) - Useful character generator
TAPE MERGE/APPEND (d9.50 c7.50) -Line interleaving
THE LAST ONE (d97.50) - Generates BASIC programs
THE QUILL (tba) - Use this to write adventures. VG
TINY BASIC COMPILER (d11.95 c9.95)-Modest compiler
TURBO (c14.95)-Extended BASIC with useful commands
ULTRABASIC-64 (d24.95 c22.95) - 50+ BASIC commands
VICTREE (r53.00) -Sophisticated toolkit. Excellent
ZOOM (d12.50 c10.50) -Assembler/monitor/quicktrace

Business & Finance

[] ACCOUNT-PAC d22.50 c22.50 [] BUSCOM DEMO d4.50 c4.50 - Demo disk or cassette for: [] BUSCOM 1 -MONTHLY ACCOUNTS d25.50 c23.00 - VAT or non-VAT versions [] BUSCOM 2 -WAGES SYSTEM d25.50 c23 - Two wages programs, weekly/monthly, tables A/B, P11, SSP [] BUSCOM 3 -RETAIL ACCOUNTS d25.50 c23.00 - Sales/Purchase [] BUSCOM 4 -STOCK SYSTEM d25.50 c23.00 - 400 records per file / 7 fields [] CASH BOOK ACCOUNTING c57.50 [] COMPANY-PAC:1 SALES + PURCHASING d91.00 [] COMPANY-PAC:2 STATEMENTS d23.00 [] COMPANY-PAC:3 STOCK CONTROL d57.00 [] COMPANY-PAC:4 NOMINAL LEDGER d57.00 [] COMPANY-PAC:5 PAYROLL d91.00 [] EASY STOCK d75.00 [] EASYVAT c39.50 - 255 entries per month, 20 cost & income categories, report facility [] FACTORY MANAGER -1 d51.75 - Assemblies Option: list parts and volumes needed to complete jobs [] FACTORY MANAGER -2 d138.00 - Production: costing / production checks. Max 100 jobs, 10 to 20processes [] FACTORY MANAGER -3 d138.00 - Stock Control: report on low stocks and daily movements [] FINAL ACCOUNTS c57.50 [] FUTURE FINANCE d75.00 - Profit & cashflow prediction and analysis for business [] FCM d35.00 [] KESTREL PURCHASE d105.00 - Purchase accounting, up to 300 accounts / 2000 monthly transactions [] KESTREL SALES d105.00 - Sales accounting, capacity as above [] KESTREL STOCK d105.00 - Stock control. Lists, movements, prices, reports, record cards, etc [] NON-VAT ACCOUNTS c24.50 - Up to 255 entries per month under 20 cost and 20 income categories [] PURCHASE LEDGER 64 d113.85 - Comprehensive ledger: 150 supplier a/c, 50 nominal a/c, plus report facility [] PURCHASE LEDGER d17.00 c14.50 - Single entry. 400 invoices per month, gross / net purchases, VAT [] QUICK COUNT BOOKKEEPING d89.00 c89.00 [] SALES LEDGER d17.50 c14.50 [] SALES LEDGER 64 d110.75 - 220 name and customer accounts. 20-line invoices. Very sophisticated [] SIMPLEX 64 d172.50 - Weekly accounts & VAT records, thorough audit trail, very good and highly recommended (demo available) [] STOCK CONTROL d138.00 - 1000-item stock details, report on low stock, daily movements

Databases

[] DATABASE d23.50 c19.50 - Stores information in a card index format [] DATAPRO d14.95 c14.95 - Standard facilities database. Very good value [] DELPHI's ORACLE d90.00 - Up to 99 fields, 9 pages/record, 10 sort levels. Excellent [] DIARY 64 r30 - 'Single page' open format data records. Print and sort. Excellent [] DFM DATABASE d24.00 c24.00 - 15-field records. Standard functions. Label print + £10 [] EASY FILE d75.00 [] HOME INVENTORY c11.50 - Three programs to enter/update, sum/display and print inventories [] HOME FILEWRITER d39.50 [] HOME MANAGER d15.00 c12.50 - Five programs: diary, budget, bank, loans, addresses [] HOME MANAGER d35.00 [] HOME OFFICE c14.95 - Combined text editor and database [] INFODISK 64 d75.00 - 180 fields, 2400 character records, links to Wordpro/Easy Script, etc [] INFOMAST d90.00 - Database. accounts, calculator, reports and word processing [] INFOTAPE 64 c16.50 - Friendly and flexible tape-based database. Very good value [] INQUIRE-PAC d45.50 [] INVENTORY 64 d27.50 - Record all your household valuables [] MAGIC DESK r45.00 - Icon-based menu datafile / wp system [] MAGPIE 64 r95.00 - Outstanding menu-driven database. Write your own applications or buy templates [] MICROFILER 64 d68.99 [] MY SECRET FILE c9.95 [] PRACTIFILE d40.00 c35.00 - Versatile database with alphanumeric sorting, and calculation [] SIMPLY FILE d69.00 - 20-field records. Mail labels. Report functions [] SOLID STATE DATABASE d59.50 c24.50 - 10-field 'card index' records. 255 cards/pages cassette, 2550 disk [] SUPERBASE 64 d88.00 (special offer price) - Perhaps the most versatile database you can buy for the 64. Very highly recommended. [] SM CUDA64 d40.00 -General purpose database [] SM ISM64 d40.00 -Index sequential file manager [] THE MANAGER d65.00 - Four-in-one database applications programs, or define your own [] TIME & MONEY MANAGER d49.00 - Financial planning and time scheduling tools [] VIZASTAR d99.00

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SHOP & GENERAL ENQUIRIES

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Computer use

[] ASSEMBLER TUTOR d29.95 c29.95 - Three-part self-tutorial for would-be assembly language programmers [] ASSEMBLY LANG PROGRAMMING c14.95 - Honeyfold's excellent beginner's guide to assembly programming []BEGINNER'S BASIC PROGRAMMING c10.50 - Complete beginner's course, plus sound and graphics aids [] BEST COMPUTER COACH d15.00 - Shows you around your computer [] BEST KEYBOARD COACH d15.00 - Familiarises you with the keyboard [] C64 BASIC TUTOR d13.75 [] C64 TOUR d 8.00 [] C64 TUTOR d21.00 c21.00 - Tutorial, display & sprite editor, musicsynth, hex/deccalculator [] EASY TUTOR c9.95 - Ten-lesson tutorial on BASIC. Program example, homework and quiz [] GORTEK c12.99 - Teaches fundamentals of BASIC in game forms (book + 11 programs) [] I AM 64 (1-3) d21.50 [] I AM 64 (4-6) d21.50

Languages

[] 64 FORTH rdc24.00 - Standard fig-FORTH. Double-precision. Text editor. Makro assembler [] CP/M r+d50.00 - Converts your 64 to CP/M system [] FOURTH r19.95 - fig-FORTH implementation, screen editor, cassette I/O [] FORTH r29.95 - Standard fig-FORTH implementation [] FORTH 64 r34.00 - fig-FORTH with text editor and makro assembler. Tape/disk I/O [] LOGO d39.95 Full implementation of popular teaching language [] LOGO DESIGN MASTER d28.00 (Koalapad £75) [] PASCAL d49.95 c14.95 - Full implemntation of ANSI Pascal. Generates p-code. Good manual [] PILOT d65.00 - Outstanding tool (authoring language) for teaching and learning [] TINY FORTH d14.95 c12.95 - Ideal low-cost fig-FORTH introduction [] TURTLE GRAPHICS II r40.00 Combines best features of LOGO and PILOT. 60 commands. Excellent [] TURTLE TOY BOX r25.00 [] TURTLE TRAINER r24.50 [] TURTLE TRACKS d21.00 [] TURTLE TUTOR r28.00 [] ZOOM PASCAL d29.95 Functions of standard Pascal, strings of USCD Pascal, + m/c features

Recreation

[] ARCHON d29.50 - High-brow strategy board game. Has received rave reviews [] BRIDGE 64 r29.95 Novice or advanced player and opponent levels. Includes basic rules [] BRIDGEMASTER c24.95 - Bridge tutor, 3-hour commentary, reference and instruction book [] CHESS d50.00 Cursor-controlled version with 15 levels, position evaluation, etc [] COLOSSUS CHESS c9.95 - Multi-level play, cursor controlled moves, display of moves, and replay. Excellent!! [] CRIBBAGE d 7.99 c5.99 - Version of the bar-room classic card game [] GRAND MASTER c17.95 - Excellent 10-level implementation of classic board game [] LEARNING BRIDGE d55.00 Charles Goren's 'Made Easy' course [] MONOPOLE c5.99 - Good implementation of the famous board game [] M.U.L.E. d29.50 - Space-age electronic Monopoly. Has received rave reviews [] OTHELLO (LP) c5.75 - Classic board game of territorial dominance (Stack lightpen £29.95) [] PATIENCE c4.99 - Computerised version of the popular card game [] PROFESSIONAL BLACKJACK d50.00 [] RENAISSANCE c8.95 - Excellent version of the classic game Othello. Highly recommended [] SARGON II d25.00 c25.00 - Highly rated version of the Royal Game [] SCRABBLE tba - Computerized version of the famous board game

Music

[] DANCING FEATS c7.95 - Intro to music and music on the 64. Play via joystick. Great fun [] DELTA MUSIC r28.00 [] MULTISOUND SYNTHESIZER c14.75 - Play the 64 like an organ. Sound effects and special effects [] MUSIC COMPOSER c9.99 - Great value utility -see, hear and save tunes using 3 of 9 instruments [] MUSIC 64 c6.95 [] SONGWRITER r29.00 [] SYNTHESOUND 64 r25.00 d25.00 Music synthesis utility [] SYNTHY MUSIC ALBUM d 8.95 Collection library of compositions made using Synthy-64 [] SYNTHY-64 d16.95 c14.95 - Music and sound synthesiser to create part harmonies (C/D/E scales) [] ULTISYNTH c14.95 - Turn you 64 into a keyboard synthesiser

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Word processing round-up

The best and the rest

by Chris Durham

There is no doubt that most micro computer manufacturers would like you to believe that their computers will be all you need, together with a printer and a suitable bit of software, to produce professional looking documents and letters, with little or no effort. The very thing every small business has been looking for: just what you need for all those letters you currently slave over a typewriter to produce.

Commodore is no exception to this. Many of its ads depict a businessman moving from office to home using his trusty CBM 64 for everything from WP to games.

Just how sensible is this? Can the CBM 64 really be as good as a dedicated word processor system costing over two or three thousand pounds?

Or can the under-£100 WP programs available for the 64 compare with the £300-plus packages sold to users of £2,000 business micros?

The simple answer is – maybe! It really all depends what you want to do with your word processor.

What is a word processor?

In its very simplest form a word processor is a program that can input, amend and print text. You aren't confined to producing the final versions as you go, which is the main difference between WP and a typewriter: you can edit, chop and change, store and recall your text before you commit it to its final printed form.

And that should all be done in a manner which is easy for the user to use and understand.

Input and output are fairly straightforward operations for the software; it is the editing part of a WP program that can let it down badly. Few people are perfect typists and one of the great joys and advantages of word processing is that it allows you to correct errors quickly without having to retype the whole document all over again. But all the virtues of word processing count for nothing if the editing procedures are so difficult to use that they can't deal with simple errors without the sort of manipulation which would put Paul Daniels to shame!

The basic editing requirements in any WP operation are:

- overtype simple character errors
- insert or delete single characters
- insert or delete multiple characters
- insert or delete whole lines of text

With these basic capabilities you can carry out most editing tasks. The majority of word processors however have considerably more facilities than these. Other common functions you can expect are:

- move whole blocks of text to a different place in the document
- copy whole blocks of text to another part of the document, leaving the original unchanged
- find the first (and subsequent) occurrences of a word or phrase
- replace any or all (or selected) occurrences of a word or phrase by different text

These begin to open up the real advantages of a word processor; whole paragraphs can be moved about in the document, phrases can be juggled until they look correct, changes to standard letters can be made quickly and easily.

Combine these features with a choice of output formats, facilities to allow documents to be saved or reloaded on disk or tape, options to allow all the features of your printer to be used, and the ability to print standard letters with different inserts and addresses in each one; then you have a word processor which is capable of doing most jobs you are likely to want.

It may surprise some people to learn that programs are available that allow the CBM 64 to do all these – and more!

Word processing on the 64

Compared to many home microcomputers, the CBM 64 has many features which make it a good machine for WP. It has a superb full-sized keyboard with a good 'feel'. It has a number of control and function keys – which can be used to simplify WP commands. It has a built-in full-screen editor that also facilitates amendments. It has sound to warn you about mistakes or potentially dangerous edits. And it has all that colour to improve the legibility of text.

Sadly not all WP programs take advantage of these. Programs written specifically for the 64 (or – with some reservations – conversions from other Commodore machines) therefore tend to be a better choice than those word processors originally written to cover a wide range of computers.

One thing prevents the CBM 64 from being an ideal word processor: the maximum of 40 characters per line on the screen. All commercial WP systems have an 80-column display, allowing much more of the document to be seen at once – and corresponding more closely to the length of line that you'd want on the typical printed document.

There are ways of getting round the problem and designers of WP packages for the 64 have used them all. First the program can accept the text in 40 columns, then reformat it when the document is printed: this we can summarise as 'format on printing'.

Alternatively the package can make the document the full width required and use the screen as a 'window' that can be scrolled across the text ('format as you type').

And third, you can use a hardware converter to display the full 80 columns on a monochrome monitor.

These methods all have their drawbacks – even if it's only a matter of cost, as with the hardware adaptor approach. The other two are more commonly used, and the choice comes down to personal preference; I much prefer the 'format as you type' approach, other people prefer to see all the text on the screen at once.

Word Processing

The best compromise would probably allow you to format as you type, with the option to reduce the screen width to 40 when typing or checking.

What's available for the 64?

The list of WP software is not exhaustive, but it does cover all the products that we have had the opportunity to look at and give an opinion on. Note that the cost is not always a good indication of the usefulness of a WP program; and the summary table will give you a guide as to those programs we consider to be value for money.

The summary chart

Each aspect of the WP programs is scored out of 5. A score of 3 indicates that the facility is adequate for all normal use; a score below 3 indicates deficiencies compared to the average. Note that a high score may indicate either a well implemented range of facilities or a larger than usual range.

The exception to this is the spelling checker column, where '0' means not available, 2 indicates available as extra, and 4 means the function is included in the program.

The 'value for money' score is basically a points per pound indication; the higher the score, the better value you are getting. It is important to relate this though to the overall facilities available; as a general rule, the more facilities you need the lower the value-for-money rating is going to be. The 80-column WP options represent poor value for money if all you want is a WP program; when you add the value of the other software you can use with them, though, they do become more reasonable. In cases like that, 'value for money' can only be decided by you!

Program:	**PAPERCLIP**
Format:	**disk**
Price:	**£98.90**
Summary:	Wealth of facilities including column manipulation, addition and subtraction, sorting – probably the most comprehensive WP available for the 64. Excellent printer options. Good manual. Formats on printing, but option for horizontal scrolling for column work etc.
Supplier:	**Kobra Micro Marketing**
Address:	**PO Box 28 Henley-on-Thames Oxfordshire RG9 1PF**
Phone:	**0491 572512**
Value for money:	**0.5**
Reviewed:	**March 1984**

Program:	**THE WORD**
Format:	**disk**
Price:	**£225.25 (includes Video Pak 80 and other software)**
Summary:	Paperclip on an 80-column screen – comments on Paperclip apply equally to this version. Format still only on printing although you can preview 80-column documents on screen.
Supplier:	**Impex Designs (UK) Ltd**
Address:	**Metro House Second Way Wembley Middlesex HA9 0TY**
Phone:	**01-900 0999**
Value for money:	**n/a**
Reviewed:	**coming in July**

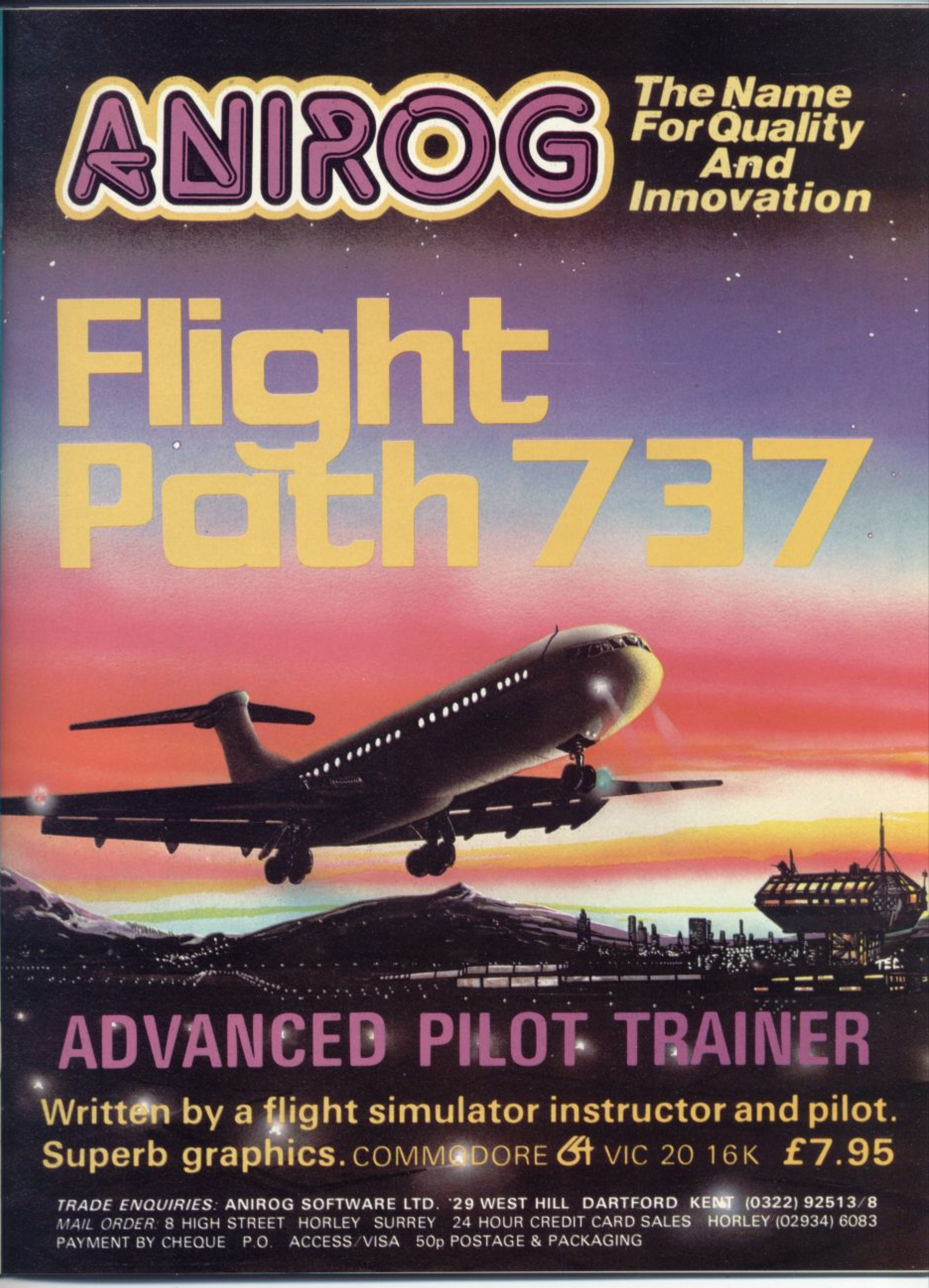
Program:	**WORD-MANAGER**
Format:	**disk (80-col), cass (40-col)**
Price:	**£142.00 (disk, includes 80-col board), £19.95 (cass)**
Summary:	Comes 'free' with Impex Video Pak 80. Ideal for small letters, though limited. Very easy to use. Formats as you type. (Cassette version is for use without 80-column unit).
Supplier:	**Impex Designs (UK) Ltd**
Address:	**Metro House Second Way Wembley Middlesex HA9 0TY**
Phone:	**01-900 0999**
Value for money:	**n/a**
Reviewed:	**coming soon**

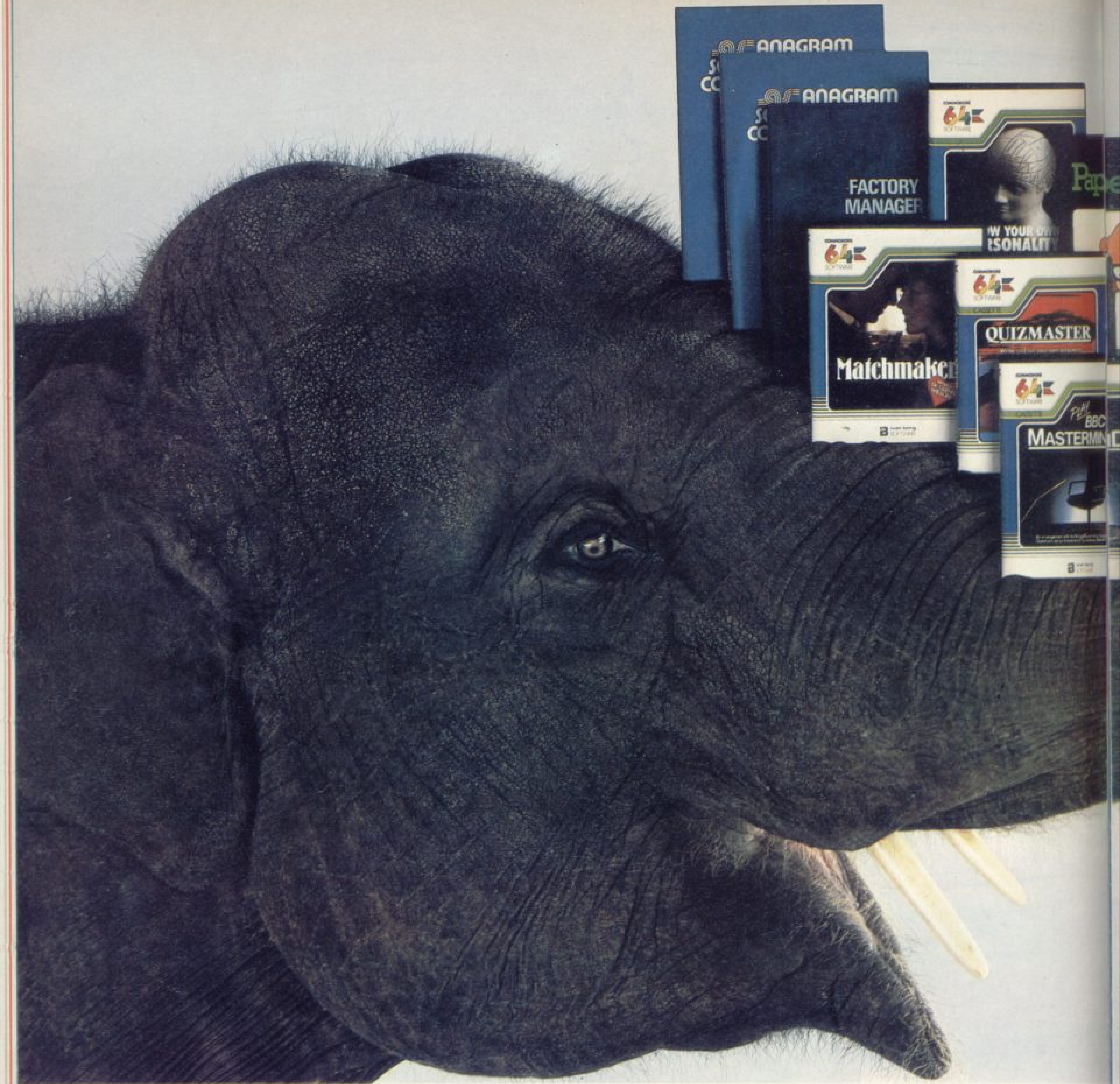
Program:	**VIZAWRITE**
Format:	**cartridge or disk**
Price:	**£79.95**
Summary:	Written specially for the 64 – uses 64's facilities to the full. Easy to use, especially as cartridge. Very good facilities. Has associated spelling checker (Vizaspell). Formats as you type with 40-column width option.
Supplier:	**VIZA Software**
Address:	**9 Mansion Row Brompton Gillingham Kent ME7 5SE**
Phone:	**0634 813780**
Value for money:	**0.6**
Reviewed:	**February 1984**

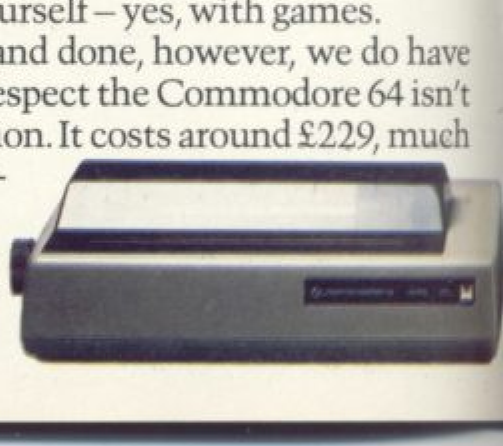
Program:	**WORDPRO 3 PLUS/64**
Format:	**disk**
Price:	**£92.00**
Summary:	Been around a long time, rather dated in some respects. Compatible with other CBM versions. Good range of facilities plus an excellent manual. Formats on printing.
Supplier:	**Wego Computers Ltd**
Address:	**22a High Street Caterham Surrey CR3 5UA**
Phone:	**0883 49235**
Value for money:	**0.4**
Reviewed:	**April 1984**

Program:	**QUICK BROWN FOX**
Format:	**cartridge or 80-column board with WP included**
Price:	**£69.00 (cart), £142.00 (80-col)**
Summary:	A lot of good facilities let down by poor editing method. Does not take advantage of the facilities of the 64. Very good manual. Formats on printing.
Supplier:	**SPT Electronics Ltd**
Address:	**Tollesbury Essex CM9 8SE**
Phone:	**0621 868484**
Value for money:	**0.5**
Reviewed:	**December 1983**

Word Processing Road Test:


ANIROG
The Name For Quality And Innovation
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ADVANCED PILOT TRAINER
Written by a flight simulator instructor and pilot.
Superb graphics. COMMODORE 64 VIC 20 16K £7.95
TRADE ENQUIRIES: ANIROG SOFTWARE LTD. 29 WEST HILL DARTFORD KENT (0322) 92513/8
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QUIZMASTER
BBC
MASTERMIND




64 SOFTWARE
PaperClip
PETSPEED 64
GORTEK AND THE MICROCHIP
HIGH FLYER
MATHEMATICS
EASY SCRIPT
SIMONS BASIC
INTRODUCTION TO BASIC - PART 1
RADAR RAT RACE
SOOPER FROOT
MATHEMATICS 2
ENGLISH LANGUAGE
PHYSICS
BIOLOGY
CHEMISTRY
HISTORY: 20TH CENTURY
GEOGRAPHY
commodore

Word Processing

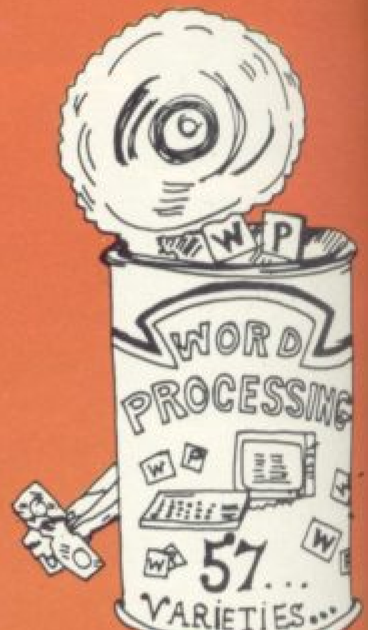
Program:	**WORDCRAFT 40**
Format:	**cartridge**
Price:	**£89.95**
Summary:	Long favourite of CBM users, compatible with Pet and Vic versions. Good range of commands that are easy to use. First edition of manual rather poor. Formats as you type.
Supplier:	**Audiogenic Ltd**
Address:	**34-36 Crown Street Reading Berkshire RG1 2SN**
Phone:	**0734 586334**
Value for money:	**0.4**
Reviewed:	**January 1984**

Program:	**SCRIPT 64**
Format:	**disk**
Price:	**£80.00**
Summary:	Built-in spelling checker. Uses non-standard method of file storage with manually updated directory. Reasonable facilities. Good selection of print options using a 'control map'. Formats on printing, but option for some 'format as you type' commands.
Supplier:	**Impex Designs (UK) Ltd**
Address:	**Metro House Second Way Wembley Middlesex HA9 0TY**
Phone:	**01-900 0999**
Value for money:	**0.5**
Reviewed:	**to be reviewed**

Program:	**WORD WIZARD 64**
Format:	**cassette**
Price:	**£5.99**
Summary:	Very low cost, very basic program for single-page letters only – adequate for what it sets out to do. Formats on printing, although tabs etc are formatted on screen as well.
Supplier:	**Bubble Bus**
Address:	**87 High Street Tonbridge Kent TN9 1RX**
Phone:	**0732 355962**

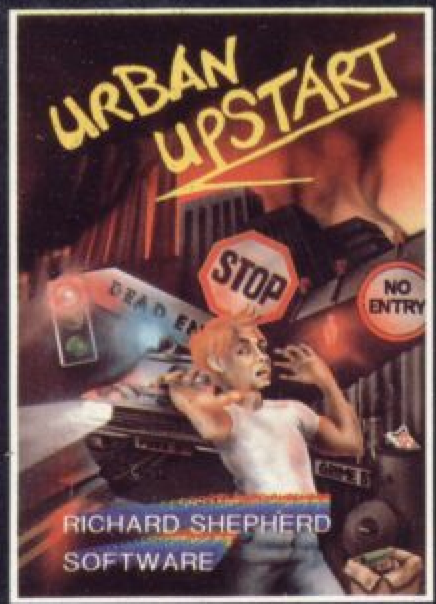
Program:	**EASYSCRIPT**
Format:	**disk**
Price:	**£75.00**
Summary:	Commodore's own product, written specifically for the 64 (by Precision Software). Good range of facilities. Easy to use and has an excellent manual. Has an associated spelling checker (Easyspell). Formats on printing.
Supplier:	**Commodore Business Machines**
Address:	**675 Ajax Avenue Slough Berkshire SL1 4BG**
Phone:	**0753 79292**
Value for money:	**0.6**
Reviewed:	**October 1983**

Program:	**SIMPLY WRITE**
Format:	**cassette or disk**
Price:	**£38.75 (cass), £46.00 (disk)**
Summary:	Written in Basic. Reasonable range of facilities, good range of printers supported. Current disk versions have full error-checking. Reasonable manual. Formats on printing.
Supplier:	**Simple Software Ltd**
Address:	**15 Havelock Road Brighton Sussex BN00 0000**
Phone:	**0273 504879**
Value for money:	**0.7**
Reviewed:	**November 1983**



	SIMPLY WRITE	QUICK BROWN FOX (40 COL)	QUICK BROWN FOX (80 COL)	WORDCRAFT 40	PAPERCLIP	VIZAWRITE	SCRIPT 64	WORDPRO 3 PLUS/64	EASYSCRIPT	WORDMANAGER (40 COL)	WORDMANAGER (80 COL)	THE WORD	WORDWIZARD 64
Price (nearest £)	£46	£69	£143	£90	£99	£80	£80	£92	£75	£20	£142	£224	£6
Use of 64 facilities	2	1	1	4	4	5	3	2	4	2	2	4	2
Editing	3	3	3	4	5	4	4	3	4	2	2	5	1
Ease of use	3	1	1	4	4	5	3	3	4	4	4	4	3
Output formatting	3	4	4	4	4	4	5	4	4	3	3	4	2
Printer support	4	4	4	3	5	3	4	2	3	2	2	5	2
Document size	3	4	4	3	4	5	4	3	4	2	2	4	1
Manual	3	4	4	2	4	3	3	5	5	3	3	5	2
Disk/tape facilities	2	4	4	4	5	5	3	4	5	3	3	5	2
Mail-merge	4	4	4	4	5	5	1	5	4	2	2	5	1
Error handling	3	4	4	4	5	5	3	3	5	3	3	5	3
Spelling check	0	0	0	0	0	2	4	0	2	0	0	0	0
80-column option	0	0	4	0	0	0	0	0	0	0	4	4	0
Overall facilities	3	4	4	4	5	4	3	4	4	2	2	5	1
TOTAL POINTS	33	37	41	40	49	50	40	38	48	28	32	53	19
Value for money score	0.7	0.5	0.3	0.4	0.5	0.6	0.5	0.4	0.6	1.4	0.2	0.2	3.1

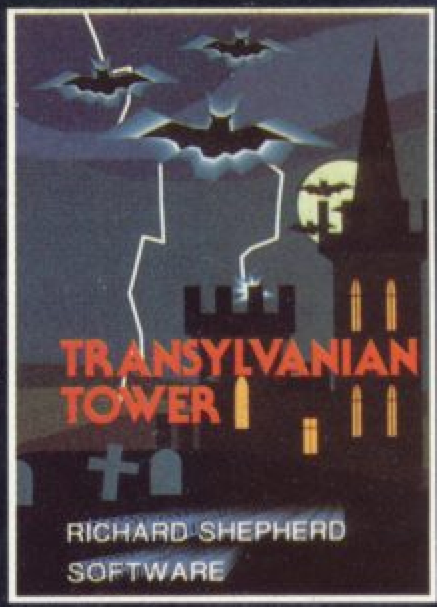
"ADVENTURES INTO IMAGINATION"



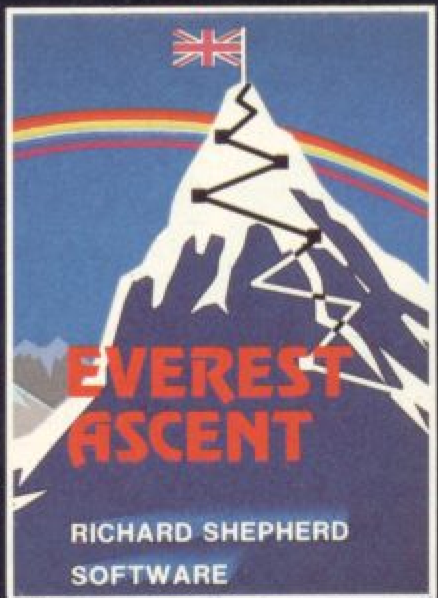
Your quest is to escape from Scarthorpe! ... a run down 20th Century Suburb where even the dogs carry flick knives. Where there's only one road in, and that's a one-way street. Not many people come to Scarthorpe, and even fewer leave ... the streets are deserted ... now is your chance to escape from over 90 graphic locations.
£6.50 Cassette £9.50 Disk



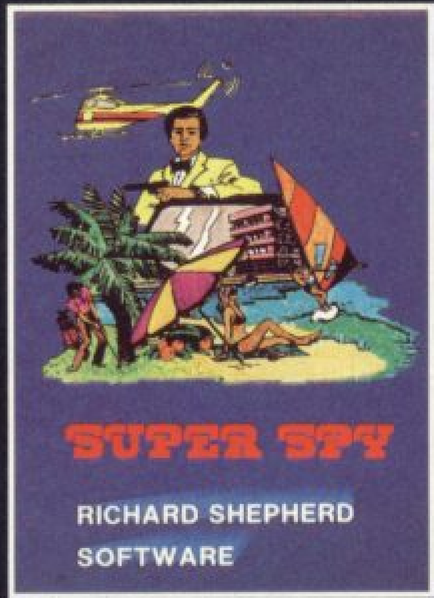
All these adventure games are also available in Cassette format for 48K Spectrum.



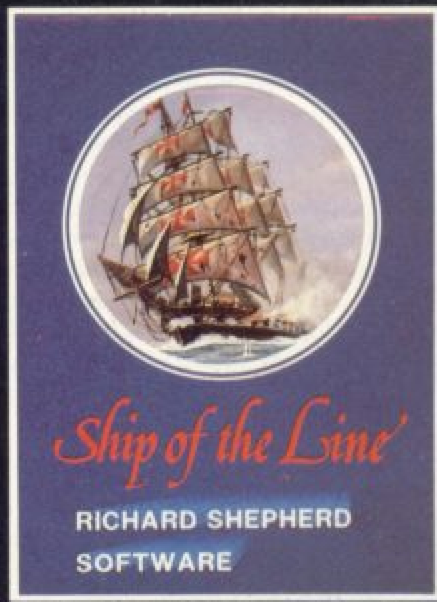
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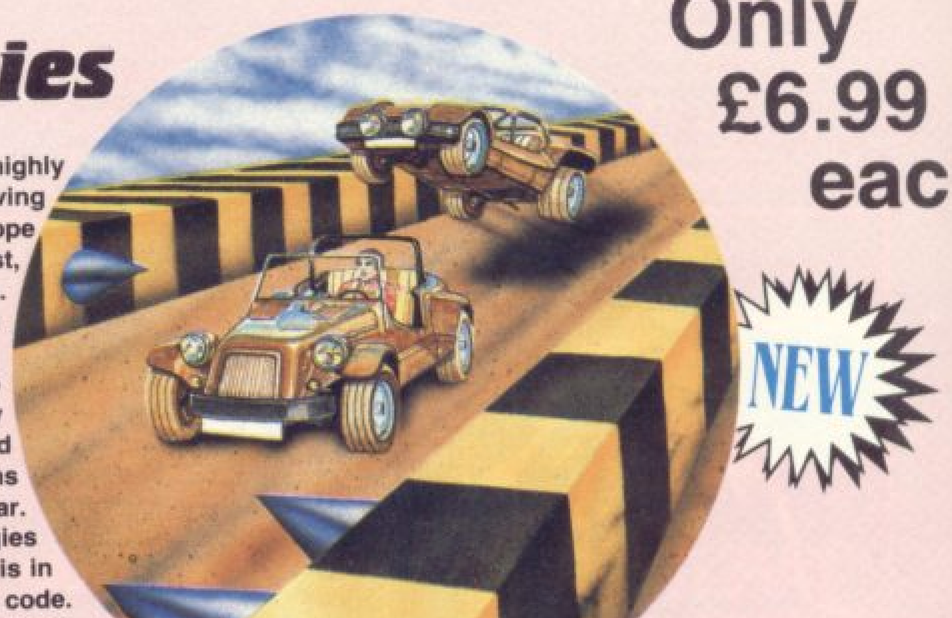
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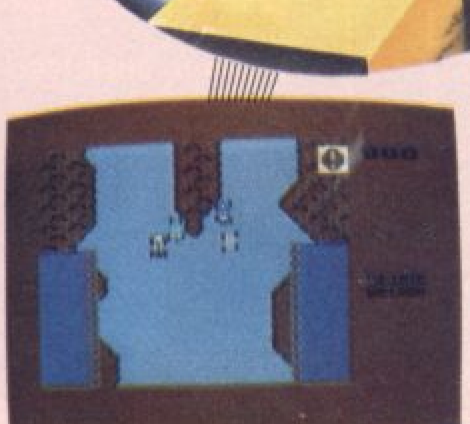


NEW





NEW



COMMODORE user
A PARADOX PUBLICATION

Deals for Readers

Welcome to DEALS FOR READERS, a collection of Special Offers from Commodore User Magazine.

This Catalogue offers you excellent deals on Vic and 64 products. Some of them, like the dustcovers and the Victuals tapes, we have produced ourselves. The others are things that we regard as Good Ideas and Good Value, mostly items we reviewed in Commodore User before we decided to sell them. On most of those we have fixed up discounts for readers (while we aren't allowed to sell books at cut price, we can include P&P in our price).

If you want to take up any of the offers, just use the Order Form on the back page. And take a look through the Catalogue: even if you don't want to buy now, we'd like to know what you might be interested in seeing in future DEALS FOR READERS catalogues – let us know in the space provided on the Order Form.

DESIGN YOUR OWN VIC SCREENS



£4.20

Brilliant idea, though it's simple really: the Cybergram Designs Vic-20 Graphics Aid Pack is a set of overlays and printed sheets on which you can design screen displays. With them you can immediately see the POKE locations you need for display and colour; and you can use successive sheets to set up a specific 'storyboard' from which to organise and visualise the sequences in a graphics program.

Your pack includes planner sheets for the standard 22 x 23 screen and plotter sheets for 1023 x 1023 hi-res graphics using the Super Expander; you also get a set of handy character designer sheets that simplify the construction of your own shapes.

Very neat, very clever – and really useful too. We're glad we can offer the Graphics Aid Pack to you ... and at a discount on the normal RRP of £4.50.

Video Splitters

Aerial and computer both on your TV! Video splitters

This nifty little gadget plugs into the aerial socket at the back of your TV set, and it means you can have your Vic/64 *and* the aerial attached *at the same time*.

No more boring fiddling around to change the plugs, no more unnecessary strain on the wiring!

£1.75



Instant database for your 64

INFOTAPE

Why buy lots of different data storage systems when just one will do? INFOTAPE 64 is a powerful yet easy to use database system for tape users, and stores up to 3,000 data items with you defining the number of fields per record. Totally flexible; and interpretive in nature, with the user having command of what data is stored and how. And file characteristics may be changed after the file has been created. Powerful 19-function calculator is built-in (giving speadsheet capability): batch processor can update or delete all or selected records. A full report generator is included to provide anything from a gummed label for a mail shot to tabular reports ...

Normal price: **£16.95**
OUR PRICE: **£9.95**



Special Offer: *When you upgrade your system to use a disk drive, INFODISK will be able to retrieve your tape records – and your INFOTAPE order from us comes with a £20 off voucher against the disk version!*

A RECOMMENDED ASSEMBLER

for Vic or 64

Tape: £17.95
Disk: £19.95

Our reviewer (June 1983 issue) concluded that Elmhirst's OSIRISAN assembler was "good value at the price." So we signed up to sell it.

Fast, commonsense operation, good features and lots of them, full error reporting ... what more could you ask of an assembler? Except maybe an editor package.

And – would you believe – it comes with FREDITOR, a general-purpose text editor that can be used for *any* text (as a mini-word processor) and /or to create a source file for the assembler. Features save, move, erase, search, instant replace.

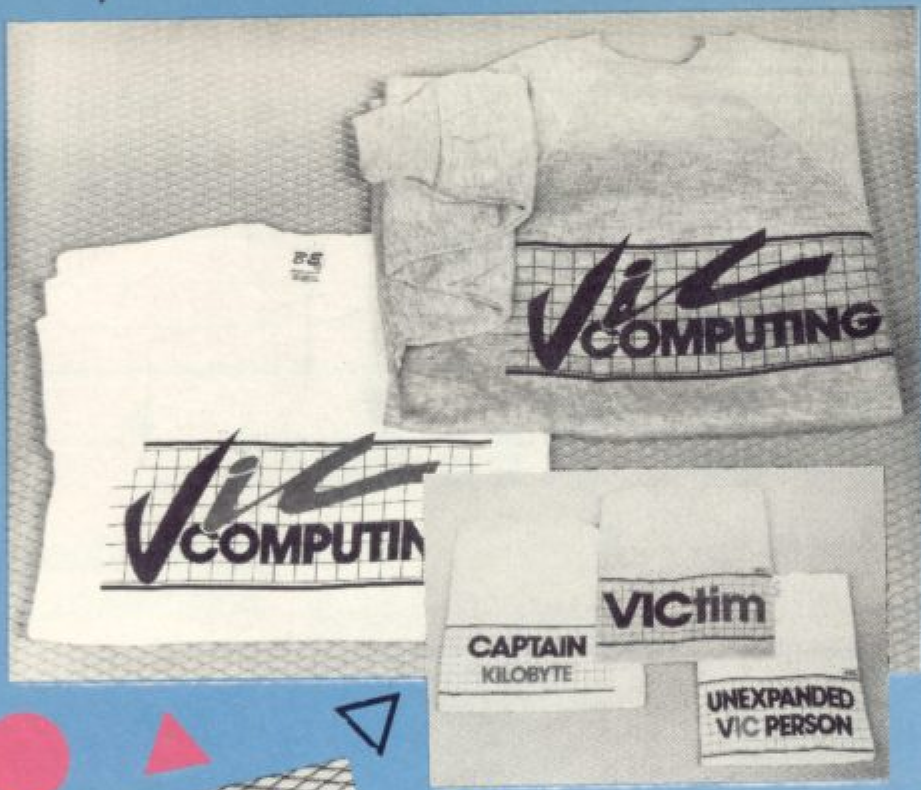


£3.99

FALLING APART?

ORDER FORM ON BACK PAGE

Our Commodore user binder holds 12 issues of the magazine (and Vic Computing fits it too!) Dark blue with the magazine's name in gold: smart, sturdy and sensible – the mags are held in by strong elasticated grips, easier and neater than the kind of binder that has metal rods for the purpose. And compare our price with what other magazines charge you for binders!



VICWEAR

Ah, happy memories... our popular collection of good-quality Vic Computing tee-shirts and sweatshirts, all with the characteristic 'Vic Computing' logo. A choice of four witty slogans or the 'Vic Computing' banner writ large. Tee-shirts in white, blue or grey: sweatshirts in grey. State colour and size when ordering – we have small, medium, large and extra large. We are running low on stocks, though – check the chart on the Order Form for availability.

Tee-shirts £3.40

Sweatshirts £7.00

TWO

better programs,

We've commissioned two special add-ons for the 64 from Whitby Computers, another company whose products we reviewed and liked. Just look what you get:

DAVID'S BASIC
... for better programs

Ways with numbers:
AVG averages elements in an array of numbers
SUM sums elements in an array
MIN finds the smallest number in an array
MAX finds the largest

Ways with strings:
PAD$ fills out a string with spaces
BLANK tests a string to see if it's blank or contains only spaces
SEARCH searches array for given string or pattern
SORT sorts arrays
SPC$ gives a string with a specified number of spaces

Coping with keys:
BREAK cancels the RUN/STOP and RESTORE reset
DISABLE kills RUN/STOP
NOKEY kills effect of specified keys

Extra goodies:
CHINKLE rings a bell
ERROR intercepts program errors, lets you branch to an error-handling routine

Cleverer programming:
CIF conditional IF
CEND conditional END
ELIF ELSE IF
ELSE ELSE
POP removes last subroutine from stack – garbage collection, avoids 'out of memory' errors
PUSH puts a subroutine return address on to stack – simulates GOTO
EXEC a bit like PROC or labelled subroutines – executes a previously specified string as a Basic statement
GTO GOTO a line with a REM followed by a label
GSUB ditto for a GOSUB
ROUT as for DEF FN, but allows you to define multiple-line routines
PER performs routines created by ROUT
ON used as ON <key> GOTO or GOSUB – quick and easy form of GET and subsequent tests
SCAN scans string for given character
SWAP loads another program, retaining all variables
SHR$ compresses a number for compact storage
XPD decompresses a number for use
RESTORE as normal, but can also be used to RESTORE to a given line number

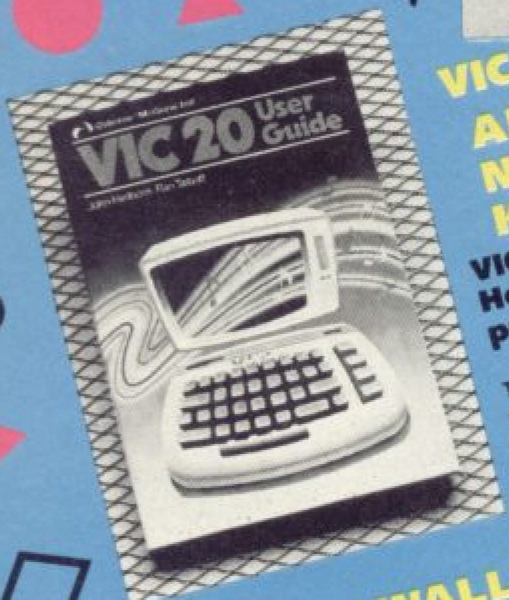
Defter displays:
CLOCK continuously displays the time at stated position
COL$ simplifies use of the 15 colours
CURSOR puts the cursor at the specified x/y position
LWIND Load Window – loads a ready-to-go screen display from disk
SWIND Save Window – creates that display
DISP displays centered message

Easier input:
DATE$ turns a numeric date back into a conventional date string format
DATIN foolproof date input routine
GENIN foolproof input routine – checks input against specified pattern of acceptable characters
NUMIN foolproof numerical input

Perfect printing:
PRINT% automatically justifies columns of money figures
PRINT£ adds true printer tabs
SCOPY screen copy
PCTRL Printer Control – sets device number and other characteristics: one command thus lets you handle different printers from a program
QUME$ use a Qume daisywheel printer for plotting

PRICE: **£27.50**

PRICE: **£27.50**



VIC: ALL YOU NEED TO KNOW

VIC 20 User Guide by John Heilborn and Ran Talbott, published by McGraw-Hill.

There are dozens of books about the Vic. But this one is the best all-rounder we've come across. Not cheap, maybe: but you get a beefy large-format paperback of 387 pages, packed with information and beautifully presented with professional illustrations and clear listings.

Ideal for beginner and expert alike. Hand-holding intro to the Vic; but also includes 'how to use' sections on disk and printer as well. Excellent on graphics and animation, on writing games, on sound (eg a good chunk on combining sound and animation).

£10.95

A GAP ON YOUR WALL?
The Commodore User Poster



£1.75

Remember our February cover, with the enigmatic monk-cum-Renaissance Man looking for the cause of his SYNTAX ERROR?
Well, we produced a poster version of it – and we have a few left over to the first 150 lucky customers. Printed in stunning colour on glossy high-quality paper, A3 size (about 16.5 by 23 ins). Just the thing for your bedroom/clubroom/computer room wall...

Sticky keytops? Things falling past the keys into the computer? Don't take the chance. When you're not using your Vic or 64, slip over one of our tailored Commodore User dustcovers – a smart black number featuring the magazine's logo on top. They do keep out dust, but they'll also cope with coffee splashes (anything less than a thunderstorm in fact!), paperclips, cigarette ash, the residue of longhaired cats, and the general detritus of daily life. One size fits all.

MATCHING COVER FOR ANY COMMODORE CASSETTE UNIT

£2.00

Keep your cassette clean too, with a matching black cover – effective, efficient.

Compare our prices. How can we do them so cheaply? And we're not compromising on quality, either: these are some of the best covers we've seen!

WEAR YOUR MAG!

Commodore User tee-shirts and sweatshirts are in good-quality cotton, ideal for late nights in front of the computer or the beach at Torremolinos or the lounge bar at the Pig and Whistle.
Cobalt blue, with the magazine's logo big and bold across the chest. State size when ordering: we have small, medium, large and extra large.



CARTRIDGES FOR THE 64

easier programming!

THE COMMODORE USER TOOLKIT ...for easier programs

What everyone needs:
AUTO automatic line numbering
DELETES deletes specified lines
EDIT deletes forwards – uses RUN/STOP to delete, leaves the cursor where it is
FIND lists all lines containing specified string
HELP lists line where error occurred
LINES instantly calculates the number of lines in your program
MERGE merges program from disk or tape, interleaving lines if necessary
RENU renumber program (including GOTOs, THENs, GOSUBs, etc)
REPLACE finds all occurrences of given string and replaces them with a specified string
TRACE displays last six lines executed in top right corner of screen during execution

Handy for variables:
DUMP lists names and current values of all non-array variables
VAR lists variable names

Sexy sprites:
DESIGN multi-colour sprite editor
SPRITE sets position, colour, mode (expanded, multicolour, transparent) for sprites: turns them on and off
HITBACK detects sprite hitting background
HITSPR detects sprite hitting another sprite
SSPRITE saves sprite data to tape or disk
LSPRITE loads sprite data

Neat extras:
MON Pet-type machine code monitor – commands for display memory and registers, load and save memory blocks, SYS-type execute, return to Basic
USER allows you to add new command words – commands must be previously written in machine code
FUNC defines function keys (the cartridge gives them useful default meanings anyhow, but they can be changed with this)
RESCUE rescues inadvertently NEWed program
SHRINK removes REMs and all unnecessary spaces
CURSOR puts the cursor at the specified x/y position
KILL removes Toolkit commands

PRICE: **£27.50 SPECIAL BARGAIN OFFER:** order the two at the same time and save a fiver – £50 for the pair!

Cut out those SAVE/LOAD errors!

Read/write errors from tape? Mucky keyboard? Grubby screen? Dirt on the tape heads can be infuriating; and who wants a tatty-looking computer?

The Complete Cleaning Kit

Here's the answer – an all-purpose Vic/64 cleaning kit. It contains...

- ★ head cleaner for the cassette deck
- ★ a pack of special lint-free wiping cloths to use with...
- ★ aerosol can of anti-static foam cleanser to lift off grease and dust
- ★ ten anti-static dust-repellent screen wipes
- ★ a package of lint-free cotton bud sticks for those hard-to-get at places (ears?), to use with...
- ★ aerosol can of safe, residue-free cleaning fluid for awkward bits of the tape deck

What excuse can you have now?





KEEP IT CLEAN



GET INSIDE THE 64

Commodore 64 – getting the most from it by Tim Onosko, published by Prentice-Hall.

£7.95

Terrific value for the beginner, especially at the price – 303 large-format paperback pages, a 'from the ground up' all-purpose manual/tutorial/reference for the 64. Concise and sensible, clear presentation, well-written. Appendices include substantial contributions from Butterfield on the 64's memory and excellent exposés of sound and graphics.

If you want to have to use only one book to get on top of your 64, buy this one!

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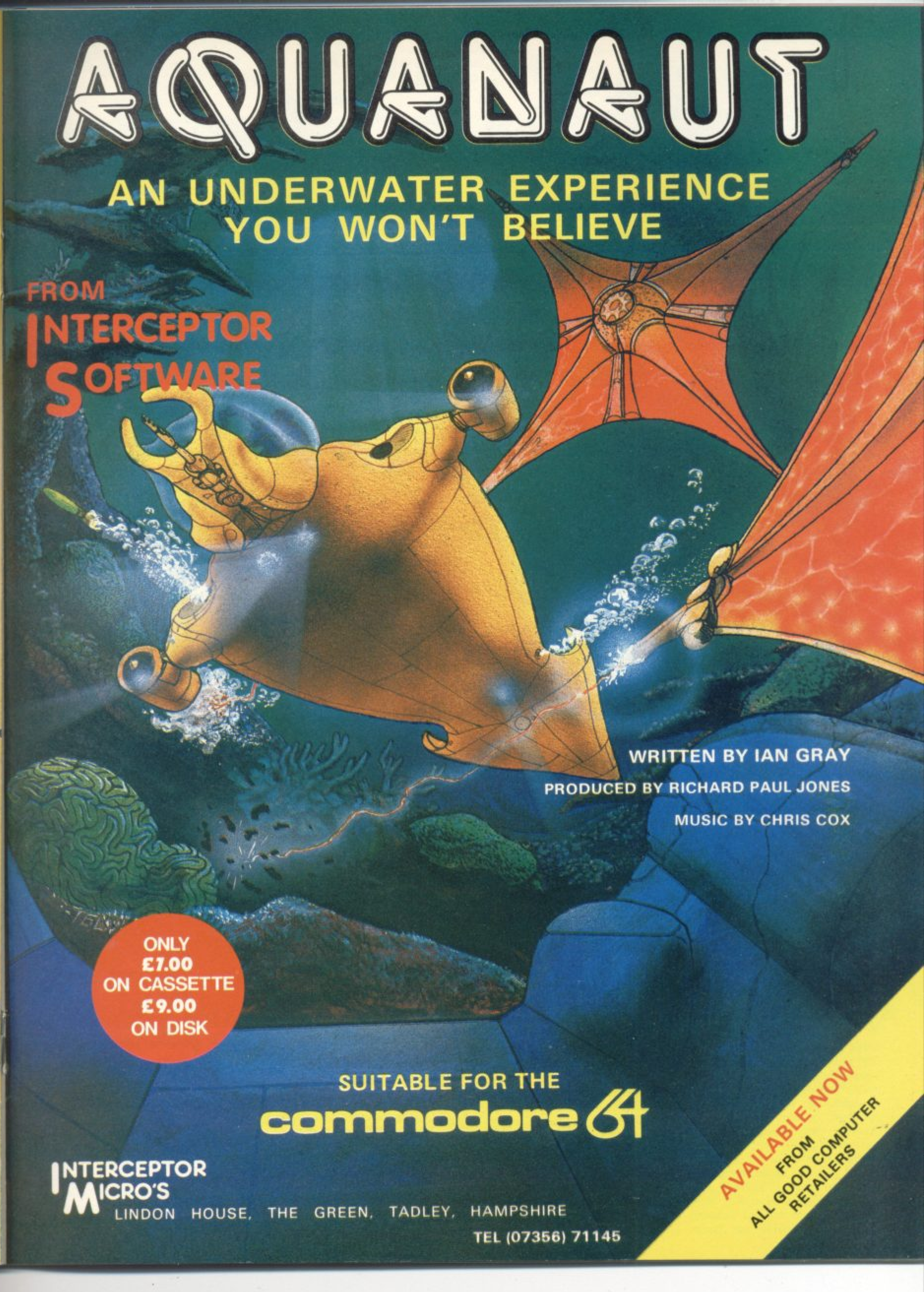
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Boots

The 64 ought to be an excellent computer for games – and fortunately some suppliers are indeed taking advantage of that. Others aren't. Here's this month's crop of reviews.

How do we assess games? Basically we play them – which may sound obvious, except that all the reviewers have seen so many games that they can apply a bit of comparative experience to the evaluation.

We rate games out of five for each of four criteria. **Presentation** means how well the thing is packaged and how good it looks on the screen: dull graphics and poor sound get marked down here. **Skill level** refers to how much skill (of whatever kind) is required to play the game – so if pure chance is involved, the game gets a low mark. (But don't dismiss it on that: some 'chance' games are great fun.) **Interest** is an answer to how well the game did at maintaining the reviewer's interest in it. And **Value for Money** is obvious enough: it's our overall conclusion about how it compares with other games and whether we'd buy it ourselves.

SCREEN SCENE

AAARGH! CONDOR

Joystick only
Price £7.95

The scene presented in this graphical game is that of a mountain landscape with a damsel laying helpless, having fallen down the mountainside. A strange vulture-like bird is swooping down to seize her and carry her off – the question is: can George, the local hero, save her? That of course depends on how good you are at controlling George's actions with the joystick.

To save the damsel, George has to climb the mountain, avoiding arrows shot by the local warriors, and deadly creatures and eggs carefully aimed at him by the vulture. Once at the top of the mountain, George must seize the conveniently placed spear and hurl it accurately at the giant bird – but he must be accurate as there is little time to spare (spear?!)

The main criticism is that only a single scene is provided compared with the many multi-framed graphic adventures now available. Nevertheless, the graphics and sound for this single scene are very good. *PR/WG*

Games Machine

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□



BONKA

Joystick only
Price £6.95

This is the first version of *Panic* for the 64 that I have seen; doubtless others will follow. Our hero has five floors to patrol in his quest of enticing the meanies into the cunningly prepared traps. To start the fun and games the all-important hammer needs to be collected from the top floor; with only one monster to avoid that shouldn't prove an insurmountable task. Each time a success is recorded, the meanies return with another added to their ranks (to a maximum of six). If you bodge up the execution process they naturally leap from the hole flashing with anger.

Large-size graphics and hall of fame are plus features; and if you're interested the screen is pink. *LS*

J Morrison (Micros)

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□

BUMPING BUGGIES

Joystick only
Price £6.99

The player, controlling a red car, is presented with a bird's-eye view of a race track. The other racers behave like stock cars by attempting to barge you off the course – it's tough out there! You can reciprocate and also boost up your score.

One ace up your sleeve is the ability to leap into the air to escape danger, but this manoeuver is only possible at speeds of 100mph plus: and approaching the water jumps that course of action is obligatory. There are four seasons to race through, marked by different colours for the course, and a choice of 20 different tracks.

A title-screen theme tune coupled with good sound effects, along with the ability to develop a dab hand throughout some complex circuits with the sense of 'going somewhere', mark this as one of the better games. *LS*

Bubble Bus

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

CENTROPODS

Joystick only
Price £5.99

This is *Centipede* given a spacy flavour by modifying the sonics and transmuting homely creepy-crawleys into galactic beings. The main adversary is now composed of rotating segments and the spider becomes a fireball. Missiles and mother ships also demand your attention.

In essence this program is virtually the same as *Cosmic Split* but with minor graphical variations. Even for a newish machine like the 64 there are an awful lot of centipedes in need of extermination.

On the whole, a worthy attempt at diversifying a familiar theme with all the usual problems still facing the player. *LS*

Rabbit

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□



CONFLICT

Joystick or Keyboard
Price £14.75

Many of the comments made about *Galaxy Conflict* apply equally well to *Conflict*. Both are board-based strategy games in which you have to manage all the resources associated with making war. But there the similarity ends. Martech has managed to produce two games on the same principle that feel very different.

In *Conflict*, instead of having your resources automatically increased by the computer each round, you either have to trade,

plunder or mine your cash. Armies can only be raised if you have the funds. This sounds like a morally healthy idea. If the game takes off it could teach a whole generation in a painless way that war costs too much.

The board is divided into rows and columns (from A to Z and from 1 to 20). More than half of it is sea. The rest is split into two territories. You can either play an 'endgame' where you try to invade the enemy city, or you can opt for more limited warfare and try to occupy the largest amount of territory after an agreed number of moves.

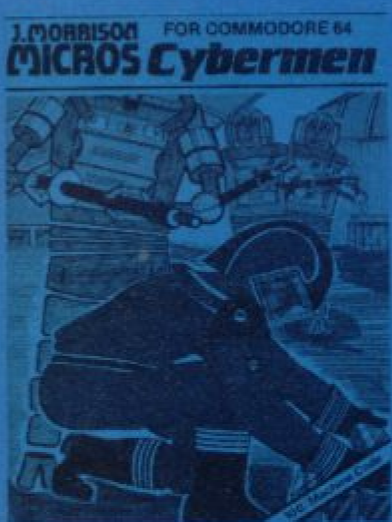
Revenue is raised through share dealing, through forays to capture neutral shipping and through prospecting for oil. The stock market values go up when the shares are bought and down when they are sold – the computer works out the relative changes in value. Oil can be found on a randomly located series of squares in each territory. Ships at sea are blown about according to the weather.

The game has enough variables affecting decision making to keep the most ardent empire-builder scratching his/her head well into the night.

TH

Martech Games

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□



CYBERMEN
Joystick only
Price £6.95

Of *Beserk/Amok* provenance, this one may well make its Yorkshire-based supplier some brass. You direct the intrepid hero through a maze of corridors with the screen sliding from one area to the next (always come out shooting!) while searching for the platinum bars scattered throughout the space station.

Robots guard each room, but these can be shot; not so the overseer, who can also pass through walls. The only method of escape here is to leg it to the next room, remembering not to linger in the doorway for fear of electrocution. Apart from avoiding bullets it's a big no-no to touch the walls. As you progress, extra robots will greet you through every portal. *Cybermen* also features a Hall of Fame.

Nice game. *LS*

J Morrison (Micros)

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□



CYCLONS
Joystick only
Price £5.99

The music from *Star Wars* proclaims this to be a space battle: but it's a contest with a difference.

Your spinning green fighter craft needs continuous monitoring to prevent it bouncing aimlessly around the screen, and (if selected from the menu) on to the jagged rocks too. The joystick controls not only direction but also velocity and I found constant adjustments to be necessary. From two to four whirling red aliens will engage you, plus one rotating purple saucer, according to difficulty level. Laser bolts may be normal or ricochet; so in all there are several options of play. Collisions between enemy ships can be arranged, adding cascades of white debris to the screen.

Overall the graphics and sound effects are adequate but not stunning. Enjoyable game, though. *LS*

Rabbit

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

DAMSEL IN DISTRESS
Keyboard only
Price £7.95

This graphical game of skill is set in medieval surroundings. Weakened by poison, your knight must leap up and down various levels of the castle to rescue the princess – who conveniently holds the antidote.

On the way he'll have to jump over ghosts and menacing spiders; and he must collect canisters which are used to build a bridge across to the princess.

There are many versions of these graphical games on the market now, but this is not one of the best. Colours and sound are good but movement is slow and jerky. Alligata also appears to have an aversion to joysticks, despite their suitability for this style of game – this one only works from the keyboard. *PR/WG*

Alligata Software

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■□□□

DICK'S DIAMONDS
Joystick or keyboard
Price £9.99

This game is highly original and totally addictive example of arcade action at its best, making good use of the colour and graphics capability of the 64.

Dicky (the owl) has had his hoard of diamonds stolen by Stephen (the spider) who guards one of them at the centre of his web. To recover it you manoeuver Dicky over the web strands (which turns black) until all the strands have been weakened and the web explodes. To make life much more difficult, the last strand to be weakened must be the central one – otherwise you lose a life. Throughout the game Stephen chases Dicky and also attempts to re-

SCREEN SCENE

build the web. If he catches Dicky, you lose a life. Great skill is required to lure Stephen into a suitable position so that the central final strand of the web can be destroyed, and the diamond recovered before you run out of time.

Numerous additional features are provided which make the game thoroughly playable by everyone. Each time a diamond is recovered, the next level becomes more difficult and both the speed of play and starting level are preselectable. From level 8 onwards Stephen's friend Cecil joins the game, posing an almost impossible task. However, if you do achieve a brilliant score, a novel feature is that highest scores can be saved to tape and reloaded next time to impress your friends.

Highly recommended, and excellent value for money. *WG/PR*

Romik Software

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■■

3D TANX
Joystick or keyboard
Price £9.99

The plot to this one is simple – you control an artillery piece overlooking a bridge and must stop the enemy tanks crossing.

You can move left or right and raise or lower your gun's elevation. Firing is rapid and you can have up to four shots in the air at once which helps to quickly deplete your limited supply of shells.

If you hit the lower half of a tank it stops, but it can still fire at you. I think it's a bit cruel that tanks behind will blow such half damaged tanks out of the way: but that's life.

Although it is a simple game I enjoyed it thoroughly. I think there is an urge in us all to wreak havoc and destruction, and this game provides a good outlet! *DB*

D'ktronics

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■■■
Value for money:	■■■■□



Fly the world's deadliest mission!
BLACK HAWK
Black Hawk is the world's deadliest aircraft, but this is the world's deadliest mission...
A strategically vital but vulnerable group of islands are under enemy control and you must liberate them.
Your target is the enemy's main airfield, heavily defended by missiles, gunships and anti-aircraft guns.
Although the speed and firepower of Black Hawk are unmatched, they alone cannot help you win through. On such a mission, strategic skill is the ultimate weapon.
Your on-board computer, with its dual attack and defence screens, will assist you in increasing your strategic loss factor (SLF) and achieving the mission objective. You also have an 8 page scenario to guide you through more than 30 missions.
Black Hawk is one of the most advanced games of action and strategy written for the Commodore 64. You will find it in all major software retailers.
£7·95
CREATIVE SPARKS
FOR COMMODORE 64
BLACK HAWK
DEADLIEST MISSION
FREE POSTER OFFER
CREATIVE SPARKS

Screen Scene



EMBASSY ASSAULT
Joystick or keyboard
Price n/a

Your mission is to watch the American Embassy and if a terrorist passes the window you shoot at him. Kill enough and you get promoted: but shoot a hostage, and demotion is immediate.

This is a simple reaction game where you move a cross-hair sight over windows and shoot. Terrorists appear in shirts of one certain colour – so don't shoot any other colour! But what makes life harder is that they change colour now and again and your best target suddenly becomes a hostage.

Every six shots you must move your gunsight to the armoury and fire at it to reload. This is usually when all the best targets appear. (It's as logical to shoot an armoury I suppose as it is to bomb fuel dumps in *Scramble* ...)

As a subject for a game the morality is a little shakey. But leaving that aside, I also found it becoming tedious after a while. The only variety is in the shirt colour changing and the overall speeding up as you get more points. DB

D'ktronics

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■■□□

FLYING FEATHERS
Joystick or keyboard
Price £6.99

Bubble Bus features commissioned music in this game and I would suggest that the graphics are noteworthy too: but the action I found less interesting.

A gamekeeper, armed with a shotgun, is protecting his fishstocks from hovering eagles in a setting akin to a landscape painting. It's a matter of downing the birds before or after they steal the fish; there's a choice of two methods of shooting, according to difficulty level. Once five of your charges have been lost the game is over – although bonus stocks are awarded every 5,000 points, announced by a flotilla of ducks.

Eight levels of skill, a high-score table and competent sound effects: not enough variation of play, however. That all makes this a game directed at the juniors. LS

Bubble Bus

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■■□□

HUNCHBACK
Joystick or keyboard
Price £6.90

Another example of a well-known pub arcade game being adapted for the CBM 64. In this case the capabilities of the machine have been used to maximum effect, resulting in an excellent game.

You control Quasimodo (the hunchback) who has to leap along the castle ramparts to rescue Esmerelda, imprisoned in the castle stronghold. To reach the princess Quasimodo must negotiate 15 screens of fun and excitement, each one more difficult than the last. These include swinging on a rope over a firey pit, dodging arrows and fireballs whilst leaping over trenches containing knights with sharp prodding pikes (oooh! that smarts!) and finally, don't forget THE BELLS!

Animation and graphics are superb: all the family will thoroughly enjoy *Hunchback*. PR/WG

Ocean Software

Presentation:	■■■■■
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■■□

METROBLITZ
Joystick only
Price £7.95

A lengthy load time is repaid by a superb example of the *City Defence* genre. As soon as you're ready to go, take a last look at the pristine, multi-hued space city you're about to defend. Umpteen different saucers and UFOs (I lost count) will make kamikaze runs at the metropolis in your charge. Each variety employs different tactics, and they may well try to ram you. There are 24 waves in total and only megaplayers will see them all – unless you cheat and preselect them. Your craft, once moved, is continuously in motion vertically or horizontally and it's quite an art to make an interception while avoiding collision with the aliens – not to mention the screen boundaries. Fortunately your laser is of the rapid fire variety: you certainly need it! Success generates glorious explosions to the accompanyment of it's-all-happening sonics. Some of the varmints will slip past your defensive efforts and smash chunks from your real estate; the game finishes, of course, when the city is no more or your fleet succumbs.

Really good graphics, superb animation – sprites coming into their own, and all very colourful. The action is utterly continuous, indeed the only respite is between attack waves, with a fair degree of skill needed.

Could this program be the reason you bought your 64? Certainly one of the best space games I've seen. LS

P.S.S.

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■■
Value for money:	■■■■■

BRIDGE 64
Joystick or keyboard
Price £29.95

BRIDGEMASTER
Joystick or keyboard
Price n/a

Here we look at two packages that approach the problem of putting the social climbers game on the screen in two very different ways. Handic's package allows considerable scope; and *Bridgemaster* aims to teach the game as well as provide 'hands' against which you can practice.

To start with we're not convinced that the *Bridgemaster* approach is the best way to learn the game; *Bridgemaster* is certainly a good stab at trying, however the introductory book (included with the two commentary tapes) is well laid out and the tapes are excellent.

Presentation on screen takes the form of so many written interpretations, hands are numbered North, West, East and South, beginning with 'hands' and no bidding sequence.

The program takes you through the essentials of bidding, to the complex routines of conventional bidding.

We certainly found it all well-presented and informative; but one small gripe was that the only correct card (or bid) could be played – all other entries were invalid. This actually omits the possibility of learning by one's mistakes, and winning all the time can get boring ...

Handic's cartridge, on the other hand, allows you to play any card you wish and therefore provides a computer opponent rather than a learning package. The presentation of Handic's seems basic, though, and there's no grading from easy to difficult hands. One large criticism is the lack of any bidding sequence – the bid is merely called and no reply given. This tends to degenerate the game to a form of wist with a bridge format.

If you're a beginner, the *Bridgemaster* package certainly comes up trumps (sic) because of the unrelenting hands to play. Handic's is one for the more experienced. Having said that we still learnt a lot from *Bridgemaster*: and overall we preferred that package. RR

Handic

Presentation:	■■■□□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■□□

Bridge Master

Presentation:	■■■■□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

NIGHTMARE PARK
Keyboard only
Price £7.99

Nightmare Park presents the player with a rudimentary maze and the object is to emerge from the exit (something like Hampton Court!) At frequent intervals during negotiation of the maze the computer presents you with problems which must be overcome for you to survive. Some of these involve brain power, such as mental arithmetic questions; others require manual dexterity such as manoeuvering your character around a herd of stampeding unicorns ... Finally, some of the problems involve pure chance, such as guessing which of three doors does not conceal a hungry lion!

The skill level is selectable and there are a wide variety of problems to solve. But graphics, animation and sound are not very impres-

sive; and the game is only likely to appeal to the younger punter who is usually less daunted by this more elementary form of games programming.
WG/PR

A R Software

Presentation:	■■□□□
Skill level:	■□□□□
Interest:	■■■□□
Value for money:	■■■□□

NEPTUNE'S DAUGHTERS
Joystick
Price £7.95

Something novel for deep-sea divers. The graphics are superb. You control a diver armed with what looks like an underwater laser. The aim of the game is to swim your man through various grottoes, avoiding the very determined octopus that swims after you through screen after screen, until you come, eventually, to the sea serpent's lair.

The concept has a lot in common with the classic 'copter arcade games where you try to fly through caves while avoiding the missiles. But the graphics and the obstacles are new enough to make this game an original.

The route through the underwater caverns is blocked in the early stages by sucker-like weeds. Repeated firing shrinks them and clears the way, but never forget the octopus. It returns again and again.

I never got to see even one of Neptune's daughters. My man kept getting caught in a no-exit cavern swarming with amoeba. These come at you from all sides and for those with normal reflexes, that's as far as you get.

Beyond this lie the monster crabs which you need to feed to the sea serpent until it falls asleep and lets you free the maiden. Sounds like a fairy tale to me. *TH*

English Software Company

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■□□
Value for money:	■■■■□



PARATROOPERS
Joystick or keyboard
Price £5.99

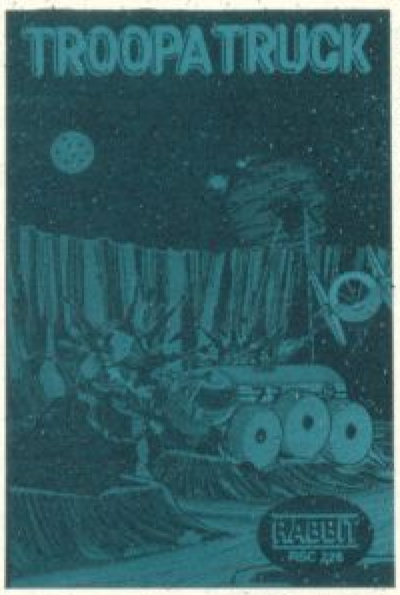
With so much action that you may mistake it for a Lebanese cease-fire, this offering also has its graphical attractions: definitely made in *Splaterama*, its appeal is directed fairly and squarely at quick-shot fiends.

After selecting the offensive/defensive options from the menu, the player finds an ack-ack gun warding off a massive armada of helicopters (with appropriate sonics) that are dropping paratroopers, complete with billowing parachutes, towards your bunker. Various bombing runs to add to the jollity. The whole scene is quite realistically depicted: the multitude of explosions enhance an already colourful scene.

Ack-ack shells can be splayed around to set up a defensive umbrella. But inevitably some commandos get through signalling a tank to enter and blast away your gun. And I found the whole animation most pleasing. *LS*

Rabbit Software

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■■



TROOPA TRUCK
Joystick or keyboard
Price £5.99

An infuriating dollop of fun which all my family enjoyed. Four separate coloured tiers of scenery scroll at different rates to provide an illusion of moving in an arid, spacious environment; a fitting tune (turned off by F1 if you insist) accompanies your buggy on its perilous journey.

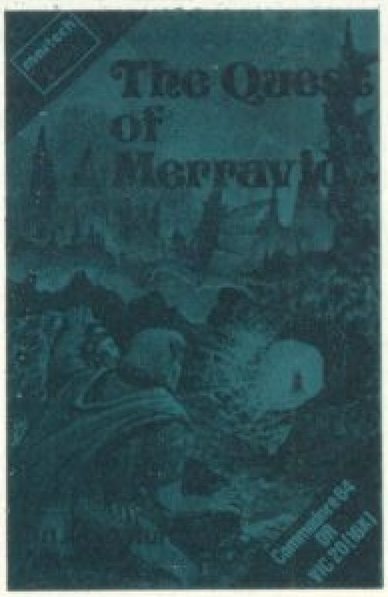
It's not unlike *Skramble* on terra firma ... except that the terra is not too firm! Craters the dumps (as in *Skramble* there seems no logic in this).

The usual format does present some orientation problems at first but this is soon overcome. After a given duration on this track you are switched to a dogfight screen, then back to the course again. After several such encounters, with different aliens each time, you get to meet the final obstacles.

Five skill levels and a demo mode (great for reviewers) are provided. It is certainly different and features unusual graphics. But to my mind the play is too disjointed; on the other hand, my youngster loved it. *LS*

Big G

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■■□



THE QUEST OF MERRAVID
CBM64 (or Vic 20 Unexpanded)
Keyboard only
Price £7.95

No prizes for guessing from the title that this is an adventure game. A novel feature though is that the single cassette has a version for the CBM 64 on one side and the Vic (+16K) on the other. If this feature were more generally adopted it would make eventual upgrading of the Vic-20 to a CBM 64 more attractive ...

This is a classic text-only adventure game in which instructions are provided in lower-case letters, with some use of colour. You are attempting to retrieve the magical firestone which was guarded by an evil dragon. Before you can engage the dragon in battle you must collect a complete suit of armour, the various pieces being scattered throughout the land ... and hence the adventure starts.

All the ingredients of the enjoyable adventure appear to be present. One criticism, however; there's no save-to-tape option so you must start afresh each time you come back to it. *WG/PR*

Martech Games

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□

ZAPPY ZOOKS
Joystick only
Price £6.99

Yet another dot-gobbling game with very little attempt to hide its *Pacman* origins. The joystick is used to guide Whirly along the space corridors collecting 'alpha particles' and avoiding the Zooks. If Whirly collects a power drain plug, the Zooks are temporarily drained of energy and in this state Whirly can catch them.

The graphics are good but not outstanding, and the movement through the maze is a little awkward. Two movement options – continuous or touch mode – are however provided, so that when you release the joystick Whirly continues in the direction you last commanded (continuous) or he stops moving (touch). Also selectable is the number of Zooks (from one to six).

The action starts off slowly but speeds up as you clear frames and move up a level – 14 different levels are provided. A final feature is a practical mode in which you can pre-select the higher levels to practice at the faster speeds.

In conclusion – no marks for originality: but not a bad version of an arcade classic. *WG/PR*

Romik Software

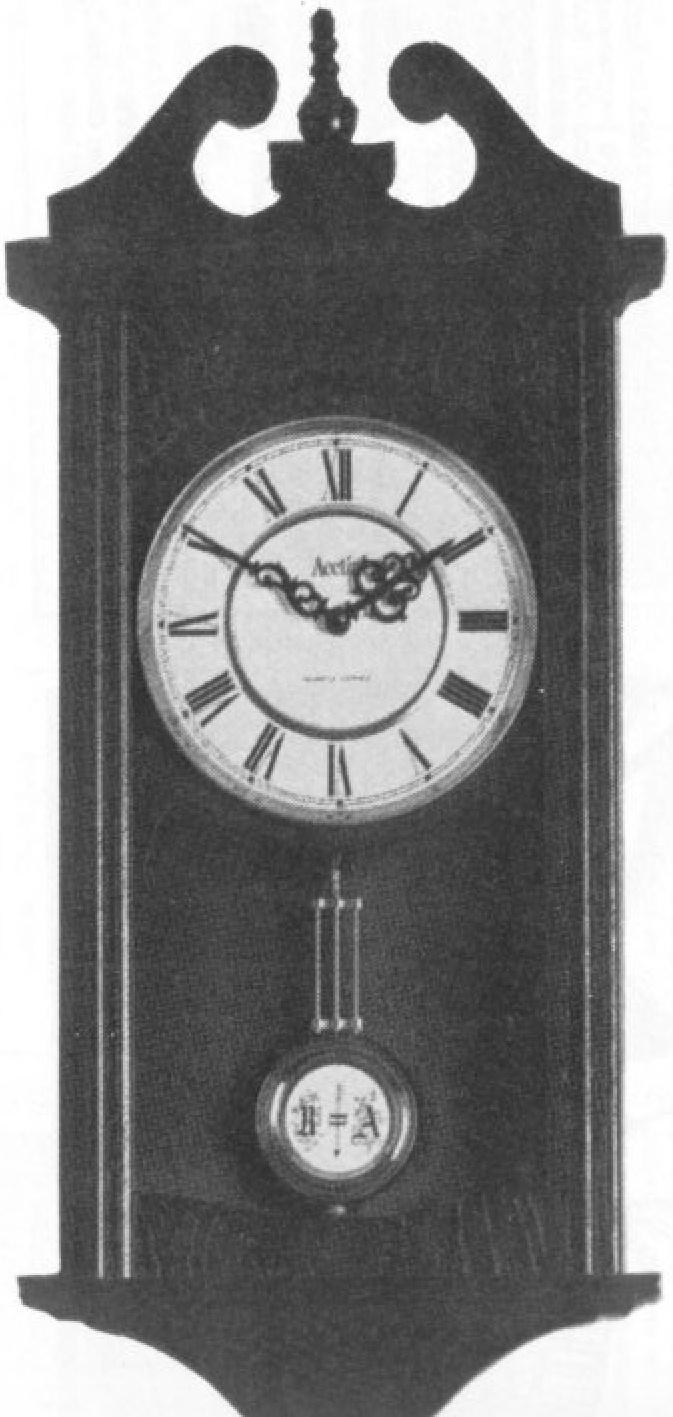
Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■■□□


HEARD THE NEWS? MICROPOWER ARE ON THEIR WAY WITH COMMODORE 64 SOFTWARE!

A Real-Time clock for the 64

by David Bolton

It's a little known fact that the 64 contains not just one but two real-time clocks – in addition to the 'software' clock using TI and TI$. The information about the clocks is in the Programmer's Reference Guide; but unless you are into reading technical appendices you wouldn't find that out. David Bolton reveals all ...



The 64 has two I/O chips known as 6526s. These are manufactured by MOS Technology, a company that is owned by Commodore, and they are upgrades for the well-known 6522 (the so-called 'Versatile Interface Adaptors', or VIAs for short). The 6526 is known as a Complex Interface Adaptor (or CIA), but I think its called a CIA because it's a chip with intelligence! *(Ohmigod – Ed.)*

Four registers in each chip control the clock times. These are registers 8,9,10 and 11; and they live at the addresses shown in the table.

Setting and reading the clock

The last two columns need some explaining. Because the clock is driven by hardware, it functions independently of the 6510 processor. This means that it can change while being read or set. Even though the processor can do about 30,000 instructions in a tenth of a second, Murphy's Law would still probably cause the clock to be changing just as it was being read or set.

To show this, consider the time as being 9:59:59.9 when the clock is read. There are four registers which must be read separately. If the *hours* element was read first, the seconds and minutes might change: and so the time would be 9:00:00.0. If *seconds* were read first, it might be read as 10:59:59.9.

(The program given later takes care of all this.)

The second problem arises because MOS Technology made the real-time clock easier to use from machine code. The clock employs a system called *Binary Coded Decimal* (BCD) instead of Binary. Instead of storing the time as an absolute time, say '47' seconds, the value is stored as two decimal digits – '4' and '7'. The true value is obtained by multiplying the left-hand digit by 16 and adding the right.

So '47' seconds is represented as 4×16+7 which is 71. This may seem an odd way to do things, but it's because the processor would have to divide by 10 to get the left-hand digit back (when displaying it) if it were actually stored as '47'. In BCD it would only have to divide by 16, which is done by a mere four instructions; division by 10 is very awkward and takes much longer.

The last thing to note is that the top bit in register 11 says whether the time is AM (the bit is cleared) or PM (it is set).

The listing

The program here sets up a machine-code routine that will display the time on the screen at all times – unless you use the cassette (in which case the screen goes

Anyway, MOS Technology thought of this when designing the chip. To set the clock, it must first be stopped and this is done when the hours value is written (or POKEd from Basic). The minutes and seconds can have their values set; and as soon as the .1 secs is written the clock restarts.

Reading the clock is similar except that the clock does not stop when the hours register is read (or PEEKed). Instead, all the time registers become 'latched'. This is an electronics term which means that the clock registers freeze with their current time, but the clock keeps on running. As soon as the 0.1 secs register is read the registers are 'unlatched' and they take on the current time.

Other hassles

There are two other problems to be dealt with before we can get our clock going. The first arises because of the difference in mains frequency between the UK and the USA. In America, the mains runs at 60Hz: and in the UK it is 50Hz. All 64s sold over here are set up for 60Hz; so when the clock starts, it only gets 50 pulses a second from the mains instead of the 60 that it assumes it needs. And so it runs 10 seconds slow every minute.

Once again MOS comes to the rescue. The people there thought of this and set a bit aside in register 14 of each chip to say whether the mains frequency is 50 or 60Hz. So before the clock is used you must do this for Chip One ...

POKE 56334, PEEK(56334) OR 128

And for Chip Two:

POKE 56590, PEEK(56590) OR 128

blank anyhow) or you press RUN/STOP and RESTORE.

Check the lines of DATA carefully and SAVE it *before* you run it. If you get it wrong when keying in, though, the program will stop and tell you.

When you first run the program, it will ask you to enter the time in the format *A/P.HH.MM.SS* – for instance "A.06.10.40" for 6.10 and 40 seconds in the morning: or "P.11.39.00" for 11.39 at night. Don't forget the dots: they are important.

When you enter the time, make it a few seconds in advance and press return about half a second before this time. Within a second the correct time will be displayed in the top right of the screen; and it will be updated every second.

The Basic program does the conversion to BCD and POKEs the registers in the correct order. Operations like disk or cassette read/writes use interrupts and will stop the display; but it will resume (at the right time) when they are finished. You can use cassette without any problems.

For the technically-minded, the machine code uses the IRQ interrupts and re-displays the time once every second. It always displays it in the current printing colour (obtained from location 646).

One obvious use I have not discussed is the creation of an alarm clock. The CIA chips have this facility built in along with the real-time clock. You can set up an 'alarm time'; and when the clock reaches this it will generate an interrupt, which might flash the screen or sound music. I'll give a program for this at a later date ...

Register	Chip 1	Chip 2	Function	Reading	Writing
8	56328	56584	0.1 secs	Unlatch	Start
9	56329	56585	seconds	—	—
10	56530	56586	minutes	—	—
11	56531	56587	AM/PM & hours	Latch	Stop

```
10 T =0:FOR I=49152 TO 49298:READ A:T = T + A:POKE I,A:NEXT
15 IF T<>18085 THEN PRINT "DATA WRONG":END
20 PRINT"[CLR][2CD]ENTER TIME (A/P.HH.MM.SS)";
30 INPUT A$:IF LEN(A$)<10 THEN 20
40 H$="A":IF LEFT$(A$,1)="P" THEN H$="P"
50 HR=1:H=VAL(MID$(A$,3,2))
60 IF H>0 AND H<13 THEN HR=H
70 MN=1:M=VAL(MID$(A$,6,2))
80 IF M>0 AND M<60 THEN MN=M
90 SE=1:S=VAL(MID$(A$,9,2))
100 IF S>0 AND S<60 THEN SE=S
110 REM NOW CHANGE TO BCD
120 IF HR >9 THEN HR=HR+6
130 IF MN > 9 THEN MN= INT(MN/10) * 16+ MN -INT(MN/10) * 10
140 IF SE > 9 THEN SE= INT(SE/10) * 16+ SE -INT(SE/10) * 10
150 REM NOW SET TIME
160 IF H$="P" THEN HR=HR + 128
170 POKE 56331,HR
180 POKE 56330,MN
190 POKE 56329,SE
200 REM START CLOCK
210 POKE 56328,0
220 REM START DISPLAYING IT
230 SYS 49152
240 END
500 DATA120,169,21,141,20,3,169,192,141,21
510 DATA3,173,14,220,9,128,141,14,220,88
520 DATA96,230,171,165,171,201,60,144,79,169
530 DATA26,133,167,169,4,133,168,24,169,0
540 DATA101,167,133,169,169,212,101,168,133,170
550 DATA173,11,220,72,160,129,41,128,240,2
560 DATA160,144,152,160,0,145,167,32,129,192
570 DATA32,134,192,104,41,127,32,111,192,169
580 DATA186,145,167,32,129,192,173,10,220,32
590 DATA111,192,169,58,145,167,32,129,192,173
600 DATA9,220,32,111,192,173,8,220,76,49
610 DATA234,72,41,240,74,74,74,74,32,124
620 DATA192,104,41,15,24,105,176,145,167,173
630 DATA134,2,145,169,230,167,208,2,230,168
640 DATA230,169,208,2,230,170,96
```

Hi-res Pictures – using your joystick

By Albert van Aardt

Here is a little program that will allow you to draw pictures on the 64's screen in high resolution. You cannot print it (hopefully somebody out there will decide to write a hi-res print utility!); but you can generate quite nifty pictures.

Lines 200 to 299 of the program provide the menu. Obviously you can change them, but watch out for line 295! You need that to set up the addresses for the hi-res screen.

Lines 230 to 250 ask for the X and Y co-ordinates to be used in starting the program. As the Commodore 64 has a resolution of 320 by 200 pixels, this is checked. Note that these co-ordinates will only be used for the first time; thereafter the plotting will start at the point where you stopped.

Lines 300 to 330 set the 64 in hi-res mode. Lines 400 to 420 clear the hi-res mode, because it will still be full of garbage from power-up (or it will contain whatever you've last put there – maybe some ol' Klingons or something).

Line 20 then reads address 56320 – that is the place where joystick 2 puts its information. Line 30 checks to see if the FIRE button has been pressed, and clears the screen if so.

Lines 50 to 130 figure out in which direction you've pushed the joystick, and line 140 calculates the point to be plotted. The actual plotting is done in line 150.

And that's it! The heart of the program is in 130 to 150, and the same coding can be used for any hi-res plotting program. By varying the value of X and Y, you can draw straight lines, curves, circles and the rest.

Type in the program as it is, and save it. Then NEW and re-enter 130 to 150, 300 to 420, and SAVE that. This is now a hi-res subroutine, and you can use it anytime you need hi-res plotting. Remember that subroutines 300-330 and 400-420 need to be run before you can use the plotting one.

Program 2 is an example hi-res program, using the lines mentioned above. You should be able to figure out what it does; it is really very simple.

```
1 GOSUB200:GOSUB300:GOSUB400
10 REM GET DIRECTION
20 J2=PEEK(56320):F=J2AND16:J2=15-(J2AND15)
30 IFF<>16THENGOSUB400:GOTO20
50 IFJ2=5ORJ2=6ORJ2=4  THENX=X-1:GOTO70
60 IFJ2=8ORJ2=9ORJ2=10 THENX=X+1
70 IFJ2=1ORJ2=5ORJ2=9  THENY=Y-1:GOTO90
80 IFJ2=2ORJ2=6ORJ2=10 THENY=Y+1
90 IFX<0  THENX=0
100 IFY<0 THENY=0
110 IFX>319 THENX=319
120 IFY>199 THENY=199
130 CH=INT(X/8):RO=INT(Y/8)
140 LN=YAND7:BY=BASE+RO*320+8*CH+LN:BI=7-(XAND7):REM TO CALCULATE POINT
150 POKEBY,PEEK(BY)OR(2↑BI):REM TO PLOT
160 GOTO 20
200 REM INSTRUCTIONS
210 PRINT"]JOYSTICK DRAW"
220 PRINT"START CO-ORDINATES. 0<X<319,  0<Y<199"
225 PRINT"▒▒(JOYSTICK IN PORT 2)"
230 INPUT "X=";X
235 INPUT "Y=";Y
240 IFX>319THEN1000
250 IFY>199THEN1000
255 CH=INT(X/8):RO=INT(Y/8)
260 PRINT"▒▒▒PRESS 'FIRE' TO CLEAR SCREEN"
270 FOR I=1TO900:NEXTI
280 PRINT"▒▒▒GOOD LUCK!"
290 FOR I=1TO900:NEXTI
295 BASE=2*4096:POKE53272,PEEK(53272)OR8
299 RETURN
300 REM SET TO HI-RES
310 POKE53265,PEEK(53265)OR32
320 FORI=1024TO2023:POKEI,3:NEXT
330 RETURN
400 REM CLEAR HI RES SCREEN
410 FORI=BASETOBASE+7999:POKEI,0:NEXT
420 RETURN
```

```
1 REM   ****** HI RES SUBROUTINE ******
2 :
3 :
4 :
10 GOSUB 9000: REM TO GET INTO HI RES
40 :
45 :
46 :REM A SIMPLE EXAMPLE
47 :
50 :REM SET UP YOUR VALUES IN X AND Y
51 :
52 :REM  X NOT > 320  AND Y NOT > 200
55 :
60 FOR A = 1 TO 200
65 X=A
70 Y=A
80 :
90 :
93 :REM  HERE THE CALCULATION AND THE PLOT IS BEING DONE
95 :
100 CH=INT(X/8):RO=INT(Y/8)
110 LN=YAND7:BY=BASE+RO*320+8*CH+LN:BI=7-(XAND7):REM TO CALCULATE POINT
120 POKEBY,PEEK(BY)OR(2↑BI):REM TO PLOT
121 :
122 :
150 NEXT A
200 GOTO200
210 :
215 :REM LINE 200 GOES INTO ENDLES LOOP
220 :
221 :
222 :
223 :
230 :
8000 :REM HERE WE SET UP THE HI RES SCREEN
8010 :
9000 BASE=2*4096:POKE53272,PEEK(53272)OR8
9010 POKE53265,PEEK(53265)OR32
9020 FORI=1024TO2023:POKEI,3:NEXT
9030 FORI=BASETOBASE+7999:POKEI,0:NEXT
9040 RETURN
```



I GOTTA KNOW! WHEN ARE MICROPOWER GONNA RELEASE THEIR COMMODORE 64 SOFTWARE?

Add your own

All about wedges

by Chris Preston

This article is all about **wedges**. And what are wedges? Well, they're very powerful things which helped to build the Pyramids and Stonehenge. No joy for all the Stone Age programmers reading this, though, because we are not going into do-it-yourself monolith building just yet (the editor – a true paeleolithic throw-back if ever I saw one – is, however, doing the research at this very moment).

What we are going to cover instead is 'wedging' extra commands for the Vic and the 64, and extra statements for Basic.

When the interpreter in your Vic or 64 is running a Basic program, it scans the data (that is your program) in memory, decodes it and then executes it. As none of the Commodore versions of Basic perform syntax – checking when the lines are typed in, we can add extra statements which are nonsense to the existing Basic ... provided that we also add a routine to do the decoding and execution before Basic gets hold of them and throws up a SYNTAX ERROR.

This is a very good argument against having syntax-checking at entry time, of course; so all those people who boast that their machines do something that Commodore machines don't, now know why – Commodore (or rather Microsoft, who wrote the Basic) knew better than that!

Basic wedging

So how can we intercept data from the Basic program before the interpreter gets hold of it? Surely the interpreter is all in ROM and cannot be changed?

Well, not *all* of the interpreter is in ROM. There is one very small but vitally important subroutine in RAM in zero page. It is called **CHRGET** and it gets the next character from the Basic program. *All* the data read by the interpreter passes through this routine; it's in RAM so we can change it as much as we want. This is the obvious place to insert a patch.

This is the listing of CHRGET for the Vic and the 64. (The subroutine is exactly the same in all Commodore machines, but at slightly different addresses.) The pointer in $7A and $7B is called TXTPTR and points to the character in the Basic program which is to be read.

The subroutine has two entry points which are both used by the interpreter: **CHRGET** increments TXTPTR before reading a character (and thus it reads the next character in the program), **CHRGOT** reads a character without incrementing TXTPTR (and so it gets the last character again).

When you type in a RUN command, the interpreter sets TXTPTR to point to the start of the Basic program. As the program is executed, characters are read and TXTPTR is incremented.

When it executes a statement involving a jump, such as GOTO, GOSUB or RETURN, the interpreter just loads the address of the start of the line into TXTPTR – so the next characters read are those from the new line.

Changing CHRGET

So how are we to change this to allow us to add some extra commands? Figure 1 shows a listing of a program which adds extra commands to Vic Basic. In fact the program only adds one extra command **HELLO**; it prints the message "HELLO JOHN! HOW ARE YOU?" on the screen – not a very useful command, to be sure, but it does show the principles of how the thing is done.

The program is in three parts. The first, called ENTRY, is only called once. It lowers the top of memory to protect the program and modifies CHRGET to allow the second part of the program, DECODE to examine the Basic text.

DECODE, the section section, scans the Basic looking for one of the commands in the command table COMTAB. If it finds a match, it finds the address of the routine to handle the command from COMTAB and then jumps to that routine.

The final section of the program is, of course, the routines to carry out the extra commands – in this case, there's just one, HELLO.

Now let's look at each section in turn. **ENTRY** is quite short: it sets the top-of-Basic-memory pointer to protect the program and modifies CHRGET, then it prints a sign-on message and returns it to Basic.

The modification carried out to CHRGET is to insert a JMP DECODE instruction after the LDA TXTPTR instruction at $79. This means that every time CHRGET is called it will jump to DECODE, so we'll look at that next.

The key section

DECODE, of course, is the most important part of the program as far as this article is concerned. This is the section which actually allows us to add the extra commands we want.

The first thing that DECODE has to do is save all the processor registers on the stack. It then looks at the return address on the stack to see where the call to CHRGET was made from. This is important because we only want to use the extra commands when Basic is actually executing a statement, either in direct or deferred mode – if we are not careful, we will find ourselves executing the HELLO subroutine when we are keying a program line into the machine!

Having made sure that Basic is really running, we can now look at the text to see if it matches any of the commands in the command table COMTAB. The entries in this table are in normal ASCII form, except that the last character is shifted – that is, it has $80 added to it. This allows DECODE to detect the end of a command by using the 6502's negative flag.

Each command is followed by

Location	Data			Function
0073	E6 7A	CHRGET	INC 7A	Increment TXTPTR
0075	D0 02		BNE CHRGOT	
0077	E6 7B	CHRGOT	INC 7B	
0079	AD 00 20		LDA 200	get character
007C	C9 3A		CMP # :	
007E	B0 0A		BCS CHRGT1	
0080	C9 20		CMP #$20	ignore spaces
0082	F0 EF		BEQ CHRGET	
0084	38		SEC	clear Carry Flag if character is a digit
0085	E9 30		SBC #$30	
0087	38		SEC	
0088	E9 D0		SBC #$D0	
008A	60	CHRGT1	RTS	

the address of the routine minus 1 – (we'll see why we have to take 1 off the address a little later). The end of the table is marked by a byte containing zero. The section of DECODE which checks the command name starts at DECOD7.

Rather than use the CMP instruction to compare the character from the command table with the one from the Basic program, I use EOR. This still sets the processor-zero flag if the two bytes are identical; but if the only difference is the top bit, it additionally leaves $80 in the accumulator.

As the last character in the command has $80 added to it, this allows you to get a match between "o" and "O" in this case. It also allows you to use the Commodore form for abbreviated commands; so hE, heL and helL will all work as well.

If two characters do not match (DECOD3), the program calls FENDCM; this finds the end of a command in COMTAB by searching for a shifted character. We then skip over the jump address and test for the end of the table by testing for the next byte being a zero. If it is, then we have not found one of the extra commands, and the program restores all the 6502 registers and lets Basic get on with its job.

If the two characters are the same, the program jumps to DECOD1. This just increments the pointers (so that we can look at the next pair of characters) and then jumps back to DECD12. If the two characters differ only in the top bit, bit 7, the program goes to DECOD2 which checks if we have reached the end of the command in COMTAB. If not, then we have found an abbreviated command, and the program has to move the pointer TMP0 to point to the end of the command.

In either case, when the program reaches DECD13 we have found one of the extra commands, and the TMP0 points to the end of the command entry in COMTAB.

Up till now we have not altered TXTPTR – which is obviously important because we would want to jump back to the interpreter with TXTPTR intact if we could not find one of our commands in the Basic text. Now that we *have* identified a command, TXTPTR has to be moved to point to the end of the command so that later routines can use it.

All we have to do now is get the jump address from COMTAB and jump to the routine. TMP0 points to the last character in the command name, so we need to set the Y register to 1 to read the first byte of the address using the indirect indexed addressing mode.

As the 6502 does not have an indexed jump instruction, we have to do a little fiddle. What we do is to push the address on to the stack and then do a RTS! The processor pulls the address off the stack just as though it had been put there by a JSR instruction and jumps to the routine. Remember that we stored the address-1 in COMTAB? This is because the RTS instruction adds 1 to the value it pulls off the stack before jumping to it.

The new command

And so we come to the last section, a sample extra command, executed by the routine HELLO. This simply prints a silly message on the screen and then runs into a section called ENDCOM.

As its name suggests, this routine is where the program goes at the end of a command. All the routines to handle extra commands should jump here at the end. It restores the 6502 registers, then tests whether the interpreter is executing a program statement (in which case ENDCM1 jumps to CHRGOT to continue executions) or a direct statement (whereupon the program returns to Basic at command level).

And that is it! All you have to do now is dream up your own commands. The command names are put in COMTAB, with the last character shifted (which adds $80 to the value), followed by the address of the routine minus 1. Don't forget to put a zero byte at the end.

If you do design any useful commands, why not drop us a line that tells us about it? We'll print anything that looks good ...

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Seal of Approval

What's the Commodore Approved Products Scheme?

by Bohdan Buciak

There's something about a seal of approval that inspires enthusiasm and attracts confidence: like the muesli bar 'approved' by Olympic runners or the Royal coat of arms on your favourite marmalade. If you've got a keen eye for such insignia, you'll have noticed that Commodore has its own stamp of approval which it emblazons benignly on specially selected products from independent suppliers.

But there's more to Commodore's Approved Products Scheme than merely being allowed to display the 'approved' logo. Commodore doesn't (and can't be expected to) give something for nothing. So it charges a royalty to companies taking part, and gives a degree of promotional and marketing support in return: in some cases, it will actually take on a product under the Commodore banner.

That sounds reasonable, but how does the scheme work out in practice? What does it do for the manufacturer or software house – or for you, the customer?

Commodore introduced the Approved Products Scheme five years ago when the Pet, originally intended for the home computing boffin, surprisingly carved a sizeable niche for itself as a business machine. Faced with the problem of providing load-and-go business software, Commodore began commissioning software houses to produce the goods.

Why didn't Commodore itself take the plunge into software? Simply because it saw itself as a shifter of hardware – no fuss, no extra development, more profit. Commodore big-wigs only recently adapted their corporate strategy to include software and peripheral production (mainly for the Vic and Commodore 64) realising, rather tardily, that a Commodore-size pile of money can be made from this tributary of the market.

Ancient history

From the beginning, the scheme involved software houses paying Commodore a royalty of five per cent on nett sales for the privilege of being included in Commodore's software catalogue.

The first catalogue appeared in the Autumn of 1979 and it supposedly helped Pet buyers choose appropriate software for their machines, reassured that it had Commodore's backing.

For its five per cent Commodore undertook to advise on product development and marketing. In theory it assessed product suitability too. And of course, the availability of the Approved Products Catalogue meant some promotion for suppliers with limited PR budgets.

Inevitably, the scheme grew in a haphazard way (Commodore itself grew in a haphazard way). Not all Pet-orientated products were included for a start. Not all suppliers were convinced of the Catalogue's value. And customers began to doubt (justifiably so, as it turned out) that all the products really had been assessed.

Fresh impetus

Apparently that's all changed now. Enter Ian Slater – carrying a sackful of 'Fresh Impetus' – when he became Commodore's Applications Marketing Manager about two years ago. (As it happens, he's subsequently moved on. But the expansion of the Scheme during 1983 and 1984 was largely his work.)

"If we were taking five per cent in royalties from these people, we ought to give them more support and back-up in other areas", he declared.

Slater's approach was to revamp the scheme by identifying areas in which Commodore's rich harvest of royalties could be most beneficially spent – for both parties.

The major one was joint promotion, in which Commodore works out a joint marketing strategy with the company selling the product – the company submits a plan linked to expected sales and a figure for expenditure is then thrashed out.

That sounds reasonably straightforward but it usually isn't – both parties invariably try to get the best deal for themselves. And since Commodore's putting up the money, guess who wins ...

Ian Slater didn't feel Commodore's stance is dictatorial. "Certainly we have a controlling influence, but it is limited. We don't interfere in a company's marketing method or advertising style. But we do restrict them mentioning other hardware their products are compatible with; the product *must* be shown on a Commodore machine."

Probably that's not too bitter a pill to swallow when Slater was dangling that great Commodore Seal in front of your nose. But there's a bigger and juicier carrot too.

Money up front

"Three months from the date of signing on to the Scheme, we send a form to the company concerned to find out the volume of the product sold. We then issue a ninety-day invoice. That means that they've got six months to pay the royalty, having already received a sum up front from Commodore for joint marketing schemes."

Of course, that benefitted Slater too; having seen the three-month figure, he was guaranteed a specific sum in royalties which would then be budgeted.

The amount spent on such marketing ventures can range from as little as £1,000 to £250,000 depending on the royalties paid (the latter is the sum recently forked out with Pegasus Software for its suite of accounting packages).

How that's spent is equally flexible and depends mainly on the size and amount of market penetration the company has already achieved. Generally, tactics include stalwarts like direct-mail, advertising, participation in Commodore shows, dealer support and even seminars and training courses.

And then there's the Approved Products Catalogue itself, the 'Bible' for all things Commodore – and it really is *all* things. One glance through its pages reveals a diversity of product from a computer desk to a software package for administering the Public Utilities Street Works Act (1950).

"At present, the catalogue contains about 75 different companies – 50 when I took over," said Slater. "We don't expect it to grow any more. In fact, it'll probably go down to 70 and the number of different products listed will stay at around 250."

Keeping such a large amount of entries up to date inevitably involves problems, especially if the catalogue is published only twice each year. That means a new product may not appear for some considerable time after it's received approval – a factor that will dampen enthusiasm for the scheme? "Keeping up to date *is* a problem. But we try to overcome that by sending a list of new products out with our monthly dealer newsletters."

Business as usual

Despite the number and range of approved products, there is nothing in the catalogue for the Vic 20 and only a small amount (right at the back) for the 64, all business stuff.

So the dramatic advent of the Vic and 64 hasn't changed the nature of the Scheme; it is still mainly business orientated. Of course, Vic and 64 enthusiasts do have the two VicSoft catalogues, produced four times each year; but that's a mail-order scheme, not an approved products list.

The Vic and 64 have affected the scheme indirectly, though. "The Vic and 64 brought Commodore more downmarket, which meant that we had to pull down the price of business systems. So now we're looking for more mass-market business packages to add to the scheme; Micro-Simplex for example, an accounting system for small retailers." At a mere £150, it's far cheaper than true 'business' packages. There's a great deal of software in the Catalogue that is far cheaper than mainstream products running on vastly more expensive machines.

Getting approval

So how does a company get its product into the Approved Product Scheme? The answer's simple – with difficulty.

Slater didn't see the scheme expanding in size despite the fact that he received about 70 new products each week for assessment. Out of that lot, only one is likely to get through.

"First of all, our technical people have to see that the product really works. The supplier has then got to prove that it is selling and that it has an established dealer distribution network; its size will obviously depend on the nature of the product.

"Lastly, the company's got to be prepared to pay the five per cent royalty on turnover – that's on the dealer price, not what the end-user pays."

Those restrictions mean that the catalogue isn't saturated with too many similar products. As Ian Slater points out, "there's room for about *five* different accounting packages, for none of them are identical – but not for 15."

There's another side to the scheme; apart from getting approval, a product may be taken on by Commodore itself. But this happens very rarely – "we say no to 99 per cent of people who ask us to take on products". That's probably because Commodore itself usually takes the initiative. "If we decide that we need a specific software package for Commodore, we'll go out and get it."

One such product was Easy Script, a word processing package for the 64 developed by Precision Software. The strategy here is that

Commodore virtually buys the product, undertakes its own packaging, marketing and advertising, but pays an agreed royalty on sales to the company which developed it.

Approval from the Approved?

On the face of it, the Scheme appears beneficial, both for Commodore (which acquires a ready-made software and peripherals base), and for the supplier (which gets Commodore's market muscle and wider scope for its product). Does that theory work out in practice?

Nigel Lovett-Turner, director of Precision Software has no doubts. "It's a bloody good Scheme in principle, there's nothing to compare with it in America". On the other hand he now regrets having sold Easy Script to Commodore under the scheme ...

"At the time, we were an embryo company. So it was the right decision for us. Now we're an established software house, we reckon we could have made a better job of marketing – but we didn't have the worldwide muscle then."

"The great advantage is that we sell in large volumes but we lose control. Commodore gives us a small royalty; we see it as miniscule, they see it as reasonable."

Loosing control meant not only accepting what looked to Precision like an unsatisfactory deal, but also having to accept Commodore's decision to give Easy Script away as a freebie with its 1541 disk-drive. "I view the free offer with trepidation. It devalues the product; anything given away is *per se* of no value."

Strong words – but he does accept that larger volumes entail larger royalties. And there's an incentive for Easy Script owners to buy Precision's own database package, Superbase 64.

Superbase 64 is merely an Approved Product. "It's a first-class product which we want under our control now that we've grown and learned. The penalty is we won't sell large volumes so quickly; it will sell in the thousands, rather than hundreds of thousands."

Precision merely pays Commodore the 5 per cent royalty and "fights hard" for a good marketing deal. "People getting involved with Commodore *must* make sure they're getting a good deal." That sounds like a warning.

One man band

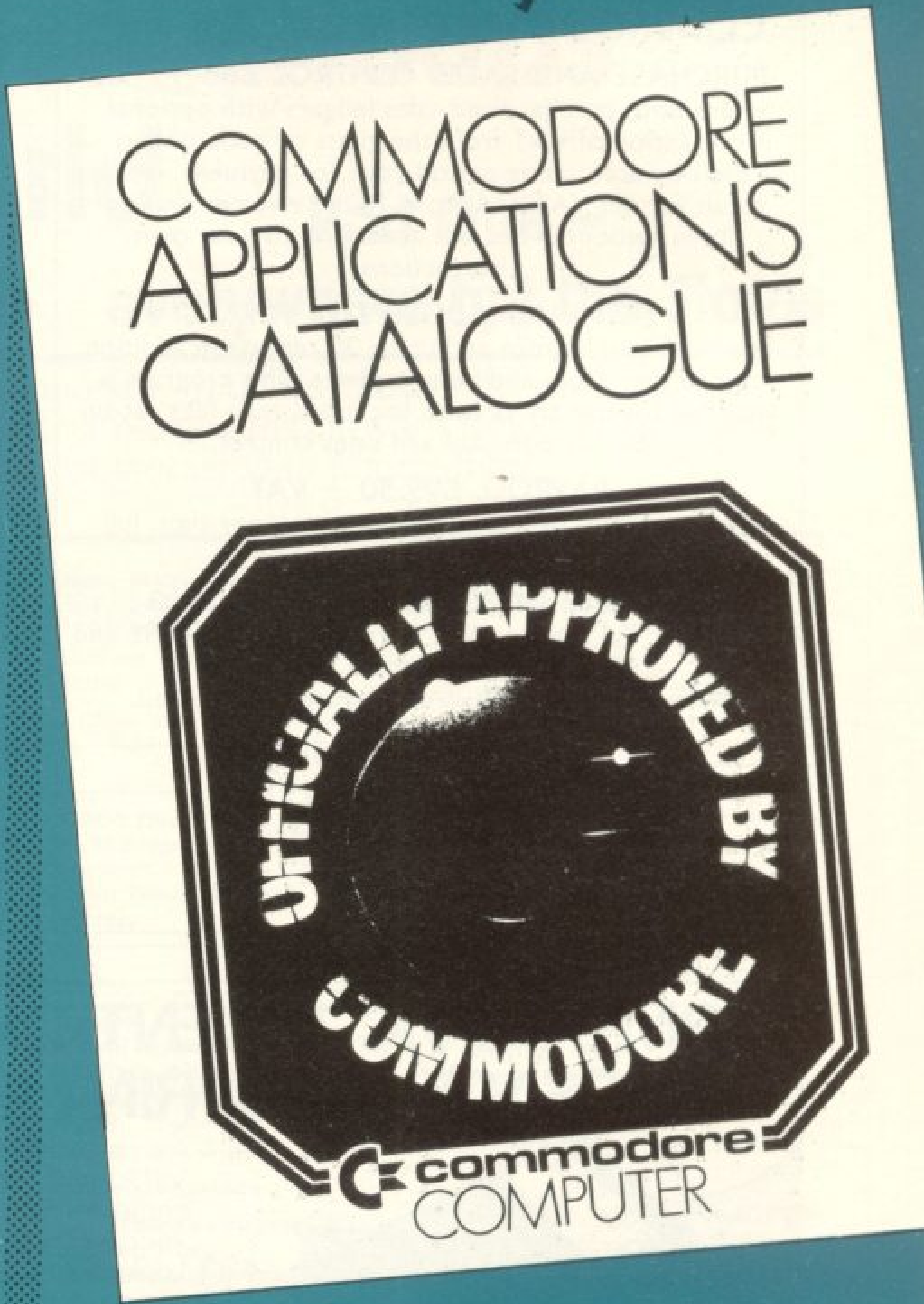
Precision Software may no longer need Commodore's marketing muscle. But Nigel Lovett-Turner points out that the Scheme could be invaluabe to a one-man-band operation.

Studio Software's boss, Michael Hopps, is a teacher who runs the business from home. He developed Designer, a screen character graphics program for his own use in schools. "Being designed for the Pet, it was low resolution so I couldn't get a publisher interested".

Despite that, Commodore took it on board as an Approved Product – perhaps because it offered a unique facility, which is obviously one of the things Ian Slater looks for. Designer has now sold more than 100 copies and Hopps has nothing but praise for Commodore. "They'll talk to me like a friend. They gave me access to technical people and lent me disk drives and other peripherals. Being in the Catalogue meant that the product got much greater publicity – especially in schools, colleges and government departments."

The business back-up and general confidence from Commodore has enabled Michael Hopps to adapt Designer for the Commodore 64. The machine's hi-res capability has opened up the computer-aided design field for him.

But he has still greater ambitions for Designer 64 – he wants Commodore to take on the product. "It would be easier for me if Commodore took on tasks like marketing, artwork and disk copying." He recognises, though, that while the product is technically sound, it's not mass-market enough for Commodore's liking.



Directional problems

That may be the Scheme's real problem; the considerations involved seem to place the emphasis on hardware and mass-market products. Is that the direction in which the scheme seems to be heading?

Under Ian Slater's regime the number of products or suppliers was not to increase. He also felt that the Scheme came about as a stop-gap measure – "two years ago, we identified a software emphasis and our interim solution was the Approved Products Scheme".

This suggests that the Scheme was merely a temporary solution to one of Commodore's problems at the time – the need to grab a business software base quickly. Now Commodore has got around to producing its own software for the Vic and 64. That policy doesn't yet conflict with the Scheme; but even Ian Slater recognised that one day it *could*.

If the Approved Product Scheme gives the impression that it helps both Commodore and its independent suppliers make more money, it's probably doing its job.

But there must also be something in it for the user. "The user gets the assurance that Commodore has seen and assessed the product, and that the product has established itself in its field," assured Slater. But he quickly added: "there's no come-back to Commodore if the product doesn't work".

Should we approve of those sentiments?

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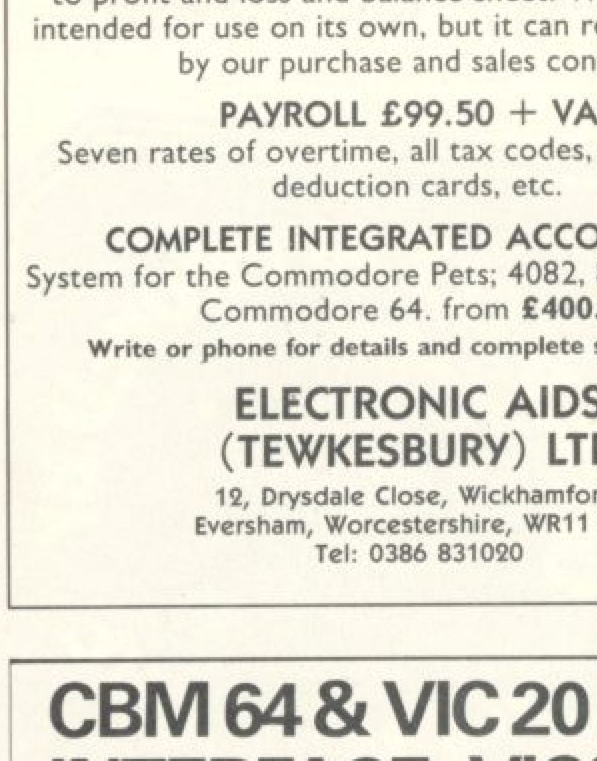
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Commodore User Groups around the world

Our annual survey

Part One – everywhere but the States

We've been collecting and updating our information on users' clubs and groups that Victims, 64 enthusiasts and vicariously interested parties might want to join. Here's the list so far – and clubs not listed are invited to contact us with information.

Next month – clubs in the USA.

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National

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(Independent Commodore Products User Group)
Membership Secretary
30 Brancaster Road
Newbury Park
Ilford
Essex IG2 7EP

... established and active, with good bi-monthly newsletter and lots of local groups (some listed here. Annual sub £10 (UK and Eire), £15.00 (Europe), £26 (elsewhere by air mail).

ACC
(Amateur Computer Club)
c/o Rupert Steele
St. John's College
Oxford OX1 3JP

... also well established and also active – covers all home computers. Technical bias. Local sub-groups.

National Association of Vic-20 Users
c/o S Tommenak
20 Milner Road
Sherwood Nottingham

Commodore 64 Independent Users Group
c/o C Embrey
17 Santon Avenue
Fallowfield Manchester

London

Association of London Computer Clubs
13 Compton Road
London N1 2PA

... an umbrella organisation for two dozen London-area organisations; ALCC organises the London Computer Fair among other things.

North London Hobby Computer Club
c/o Dept of Electronic & Communications Engineering
Polytechnic of North London
Holloway Road
London N7 8DB

... £30 pa for adults, £8 for unemployed and Poly students. Highly organised, lots of subsections including CBM.

ICPUG North London
c/o Barry Miles
Dept of Business Studies
Polytechnic of North London
Holloway Road
London N7 8DB

Vic 20 User Group
c/o Jim Chambers
Dept of Psychology
University College
26 Bedford Way
London WC1

Berks

ICGUP (Slough)
c/o Brian Jones
Slough College of Higher Education
Wellington Street
Slough

... £4 pa.

Bucks

High Wycombe Commodore User Group
c/o Richard Onion
19 Frogmoor Close
Hughenden Valley
High Wycombe

... £1 pa mostly for Vics.

Clywd

ICPUG Clywd
c/o F Jones
77 Millbank Road
Rhyl

Derby

ICPUG Derby
c/o Ray Davies
105 Normanton Road
Derby DE1 2GG

... £3 pa. Includes Vics.

Derby Microcomputer Society
c/o F Taylor
5 Park View Close
Allestree
Derby

... £5 pa. Includes Vics and 64s.

Devon

ICPUG Devon
c/o M Stibbe
The Lawn
Lower Woodfield Road
Torquay

Dorset

Bridport Computer Club
c/o M J Higgins
BBC Transmitting Station
Rampisham Down
Maiden Newton
Dorchester

... started in January.

Bournemouth Computer Club
c/o Peter Hibbs
54 Runnymede Avenue
Bournemouth BH11 9SE

... £5 pa. 100 members. Includes Vics and 64s – subgroup for these.

ICPUG Dorset
c/o D Shave
97 Camford Cliffs Road
Poole BH13 7EP

Dyfed

ICPUG Dyfed
c/o F Townsend
The Hill
Rhydowen
Llandyssul SA44 4QD

Essex

Basildon Computer Club
c/o Peter Silver
24 Havengore Pitsea

... £5 pa.

Brentwood Microcomputer Club
c/o Allan Holland
212 Woodland Avenue
Hutton
Brentwood CM13 1DA

... Includes a section devoted to Commodore users.

ICPUG Essex
c/o Tony Surridge
97 Shelley Road Chelmsford

Gloucestershire

ICPUG West of England
c/o Janet Rich
Rose Cottage
20 Old Court
Springhill Glos GL11 5PF

Hampshire

ICPUG Hants
c/o Ron Geere
109 York Road
Farnborough Hants GU14 6NQ

Southampton ACC
c/o Paul Blitz
Gardenways
Chilworth Tower
Chilworth Southampton SO1 7JH

... Local branch of Amateur Computer Club. 100 members, £5 pa. Includes Vics.

Herts

ICPUG North Herts
c/o Brian Grainger
73 Minehead Way
Stevenage SG1 2HZ

CRS Home Computer Club
c/o Robert Crutchfield
2 Durham Road
Stevenage SG1 4HS

... 50p per meeting. Includes Vics and 64s

Humberside

Grimsby Computer Club
c/o J Lee
29 Park View
Cleethorpes DN35 7TG

... £8 pa. Includes Vics and 64s.

Scunthorpe Computer Club
c/o D Needham
37 High Lees Road
Scunthorpe DN17 2QA

... £5 pa. Includes Vics and 64s.

Kent

Gravesend Computer Club
c/o The extra Tuition Centre
39 The Terrace
Gravesend Kent DA12 2BA

... £6 pa (£3 for unwaged). About 50 members with a variety of machines.

Orpington Computer Club
c/o Roger Pyatt
23 Arundel Drive Orpington

... Includes Vics and 64s – and CB/RTTY, if that's your bag.

North Kent ACC
c/o Iain House
28 Canadian Avenue
Catford London SE6 3AS

... Local branch of Amateur Computer Club. Meets in Biggin Hill.

ICPUG Canterbury
c/o R Moseley
Rosemount
Romney Hill Maidstone

ICPUG South East
c/o Mick Ryan
164 Chesterfield Drive
Riverhead Sevenoaks

Lanarkshire

ICPUG Lanark
c/o A Quin
Dept of Environmental Studies
College of Building and Printing
60 North Hanover Street
Glasgow G1 2BP

Lancs

Microcomputer Users
c/o Dave Walsh
19 St Margarets Way Blackburn

... £2.50 pa. Includes Vics and 64s.

Leicestershire

Beaumont Leys Micro Club
c/o I Lumb
103 Lime Grove Road
Beaumont Leys LE4 0UF

... £2.50 pa unwaged. £5 pa for others. Mostly Vics.

Merseyside

Wirral Microcomputer Users Group
c/o Mike Keegan
205 Holmlands Drive
Oxton Birkenhead

... £5.50 pa.

Middlesex

ICPUG West London
c/o Geoff Squibb
108 Teddington Park Road
Teddington

Norfolk

Vic-20 Cromer
c/o J Blair
7 Beach Road Cromer

... Club based on local ICPUG branch.

Northants

ICPUG Northants
c/o Peter Ashby
215 Lincoln Way
Corby

Vic-Pet Club
c/o Peter Wilson
26 North Cape Walk
Corby

Oxfordshire

ICPUG
c/o J Temple
'Kirabanda'
Rose Bank
Bloxham

ICPUG
c/o I Blyth
40 Wilmot Close Whitney

Strathclyde

ICPUG Ayr
c/o J Shankland
2 Strathdoon Place Ayr

Sussex

East Grinstead Computer Club
c/o M Wellspring
19 Aviary Way
Crawley Down

Worcestershire

ICPUG South Midlands
c/o M Merriman
12 York Street
Stourport-on-Severn

IRELAND

Irish Amateur Computer Club
c/o Austin Vaughan
35 Monastery Drive
Dublin 22

... has a Commodore section, produces a newsletter.

East Antrim Computer Club
c/o David Bolton
19 Carrickburn Road
Carrickfergus
Co Antrim

... £5 pa. David writes for us.

Commodore Users Group
c/o 77 Hillside
Greystones
Co Wicklow

... £12 pa. Fortnightly meetings in Dublin, newsletters, over 1,000 programs in library.

EUROPE

Finland

Vic-Club
Matti Aarnio
Linnustajankj 2B7
SF-02940
Espoo 94

Netherlands

Pet Benelux Exchange
Johan Schilde Copytronics
Burg. van Suchelenstraat 46
7413 XP Deventer

... Highly organised, very professional. Lots of Vic/64 coverage.

Italy

Vic Club
c/o Guiseppe Jacob
Sardo Guiseppe via Ortensie
no 8 57100 Livorno

Denmark

CBM Club DK
Frederiks Allé 53
DK-8000 Aarhus C.

... Keen and very active.

France

Le Club MICRO
College Pierre Dubois
71 rue Victor Boissel
53000 Laval

Club Vic-20 Commodore 64
Leon Britan
20 rue Leo Desjardius
93250 Villemomble

Microtel
87 Route du Polygone
67100 Strasbourg

... Includes a Vic section.

Norway

Vic Club
Nedre Bankegt 10
1750 Halden

Canada

Nova Scotia Commodore Computers Users Group
Andrew Cornwall
66 Landrace Crescent
Dartmouth
N.S. B2W 2P9

Vancouver Pet Users Group
Membership Secretary
P.O. Box 91164
West Vancouver
British Columbia V7V 3N6

ELSEWHERE

Mexico

Associacion de Usarios Commodore
c/o Alejandro Lopez Arechiga
Holbein 174-6 Piso 18 DF

Korea

Commodore Users Club
c/o S K Cha
KPO Box 1437 Seoul

South Africa

Pretoria Commodore Computer Club
c/o F Jordan
62 Monument Avenue
Lyttleton Manor Pretoria 0140

Toronto Pet Users Group
Membership Secretary
Dept C
1912 A Avenue Road
Suite 1
Toronto M5M 4A1

CCCC
Roger Olanson
c/o Strictly Commodore
47 Coachwood Place
Calgary
Alberta T3H 1E1

VIC-TIMS
Greg Goss
2-830 Helena Street
Trail
British Columbia V1R 3X2

Bonnyville Vic Cursors
Ed Wittchen
Box 2100
Bonnyville Alberta T0A 0L0

New Zealand

Nelson Vic Users Group
c/o Peter Archer
PO Box 860 Nelson

Commodore Users Group
c/o Roger Altena
VHF Clubrooms
Hazel Avenue
Mount Roskill

Australia

Wonthaggi Computer Club
c/o Beth Tozer
53 Wentworth Road
Wonthaggi 3995 Victoria

Vic-Ups
c/o Eddie Mills
45 Zamia Place
Greenwood 6024
Western Australia

... Big and enthusiastic (over 140 members, two meets per week).

BOOK LOOK

The Commodore 64 Program Book



The Book:	The Commodore 64 Program Book
The Author:	Vince Apps
The Publisher:	Phoenix Publishing
Price:	£4.95
The Reviewer:	Dermot Williams
The Conclusion:	25 programs of modest standard for the prices of one commercial tape ...

This claims to be "THE Commodore 64 Program Book, with something for everyone ... a blockbusting collection".

Well, for the reasonable price of £4.95 this 122-page paperback offers 25 programs to type in. They range from adventure games, 'arcade' games, and a flight simulator: to utilities, an educational Capital Cities quiz and a machine-code assembler/disassembler. The forward tells us why "we" wrote the book; since when do programmers use the royal plural?

The format of each program is sensible: a brief description of what it does, how to use it, line-by-line lists of graphics characters used and what the various routines do (like "fire laser and check for hit") and finally the program itself: dumped directly to a Commodore printer – on balance a wise choice, eliminating the possibility of printer errors though at the expense of some legibility and the use of the Commodore control-code hieroglyphics.

The programs fall into logical batches. First are the two adventure games – *forbidden City* and *Pharoah's Curse*. Although they take input only in the simple verb/noun format they do have the useful save-game feature for when you have to surrender the family TV set! You can then reload the data when you next come to play and continue from where you left off.

Dedicated Adventurers should be able to solve either adventure in less time than it took to type in – they are by far the largest programs in the book.

(Most) readers will be glad to hear that there is the usual complement of arcade-type games. These include such (original?) gems as *Bomber, Breakout,* and *Lunar Lander*. In fairness, they are quite good: colour, sound, sprites and redefined shapes are all used – some games using all four. The sound didn't do the 64 justice, though; it is capable of far more than these programs asked of it. Also, being in Basic, some games were painfully slow.

Another 'game' is *Capitals*, a very simple "name the city" game that anyone could write within a few weeks of beginning to program. Similarly simple programs were *Metric Converter, Cheque Book* and *Binary to Decimal Converter*. A rather disappointing line-renumber program was given – it does not renumber GOTOs or GOSUBs, so thoughts of being spared the laborious task of manual renumbering are dashed!

Anagram is a simple program which jumbles up the letters of words held in DATA statements and prompts the user to guess what the word should be. Instructions for expanding the vocabulary are included, though the data in the program as it stands is large and varied. Obviously parents could add a simpler list of words for young children; or, with suitable vocubulary, it could make an interesting party game.

Morse Code is a useful program which will transmit either a jumble of random letters, a word chosen from its vocabulary at random or a message inputted by the user. I must admit rather liking this program in all its simplicity.

Last, there's a useful utility simply called *Machine Code* which combines the functions of an assembler/disassembler with the useful features of save/load machine code; it also lets you examine memory, run machine code and move memory block. This would have been an excellent program ... but for a few (major) faults.

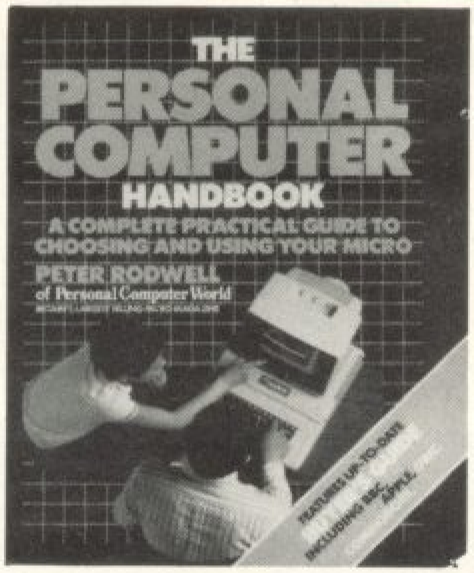
The most important of these is the fact that it does not use standard 6502/6510 mnemonics. Instead the program employs an unwieldy system of the author's own concoction, where the normal three letters (i.e. LDA ADC) must be followed by the letters IM if the operand is immediate (i.e. LDA #$SC), Z if Zero page is to be used and X,Y,ZX or ZY if the operation is to be indexed with the X or Y register. And there's more – the program operates in decimal, not hex, so LDA$22,Y would become LDAZY 34!

Anybody who knows 6502/6510 mnemonics will have great difficulty in adapting this system. For those brave enough to do so though, it offers use of (one-letter) labels; and a short sample program is given which shifts the screen one place to the left.

Overall opinion of the book? None of the programs were up to commercial standard – but then at the price you couldn't expect them to be. I think the most accurate description I can give of the programs is 'magazine standard' – that is, less than commercial quality but nevertheless worth having.

Twentyfive programs for less than the price of a normal commercial program is good value; and somebody learning programming coult take them apart one by one to reach a good understanding of many Basic concepts.

The Personal Computer Handbook



BOOK LOOK

The Book:	The Personal Computer Handbook
The Author:	Peter Rodwell
The Publisher:	Dorling Kindersley
The Price:	£8.95 paperback, £12.95 hardback
The Reviewer:	Bohdan Buciak
The Conclusion:	Good book, shame about thje price (and the defunct computers)

BOOK LOOK

General books on home computing are usually written from a standard recipe: a potted history of the computer and a simple description of the way it works. Sometimes a few more ingredients are sprinkled around to make the book worthwhile.

The Personal Computer Handbook, not surprisingly, has been cooked up in much the same way. But Peter Rodwell, its author, has tried to be more complete and more practical: and so he should – he's the last editor but one of *Personal Computer World* magazine. So has this more exhaustive approach achieved a spicier and more satisfying book?

The book's outward appearance alone encourages you to breeze through it, that's if you're not averse to the now obligatory cover shot of Junior teaching Dad how to compute. It's a large book (about the size of a *Beano* annual); and it's bright, colourful, lavishly illustrated with photos and detailed drawings; and the print is clear and bold.

The chapters, or 'modules' as the author prefers to call them (yuk!), are colour-coded and self-contained so you can dip into any part at leisure. You're helped by a meticulous system of cross-referencing. If you're reading about computer memory, for example, the mention of logic gates refers you back to the appropriate module.

Another clever and useful feature is the way main text is kept separate from the illustrations and their captions. The captions generally expand on the text so you could speed along or stop and take advantage of the greater depth offered.

But the book does have an overall structure; it falls neatly into six parts each with an Introduction that skims over the main issues. That may not be useful to computer buffs but the history of computing it contains certainly is worth a pause. It's concise and has some marvellous photos – like the one of Charles Babbage's Difference Engine, that improbable and ultimately useless pile of cogs. All the great computer intellects are here, most of them with funny names – like Hollerith, Scheutz and Vannevar Bush.

The section on how computers work will be equally gripping for the inquisitive. Again, it uses illustrations to add substantially to our understanding. Unlike many explanations of a computer's innards, this one doesn't attempt to gloss over difficult concepts. They remain difficult – logic gates, the central processor, binary, memory et al. All are discussed with a clarity and precision of expression that's rare among computer writers.

The same goes for the modules on hardware and software. If you couldn't visualise the complexity of a Z80 chip say, you'll see it exploded to the size of a table-mat and find out how it's made into the bargain. Likewise, there's a lot of cutaway drawings so you can 'see' inside a diskdrive or a cartridge. That may be valuable merely if it stops you opening the real thing and watch in horror as all the bits fall irretrievably out.

A real practical section is the one on Basic programming. It gives not only a flavour of the language but also examples of loops, arrays and suchlike. For the more experienced, there's a discussion of more advanced languages like Pascal, C, Logo, Forth and examples of the type of programs they produce. The same goes for operating systems; Rodwell answers those nagging questions about why software won't run on certain machines and why some operating systems are better than others.

Those are the plus points, but there are a few dubious areas in this book. Why devote a chapter to the basics of setting up a computer when the machine's manual would surely cover those points – and do so more specifically, too? (Incidentally, Rodwell uses the Sinclair Spectrum as an example throughout.)

Neither are there any real revelations in the section supposedly devoted to the future of computers – a great deal of time is spent talking about seeming irrelevancies like video and compact disks. The section on choosing a computer is equally unedifying: there is some sound yet diluted advice, but Rodwell goes on to give a selection of the more popular micros many of which are already out of date. Such is the nature of computing; but Peter Rodwell of all people should know that if this book is to have lasting value, better stick to less ephemeral areas.

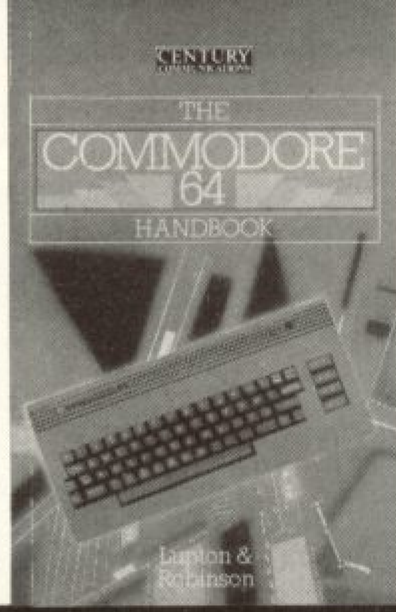
Learning about computers is a process of stripping away darkness. But there are always some niggling black patches that remain. Rodwell tries to give a rounded picture, and succeeds very well. His style is lucid – perhaps a little dry, but the copious illustrations make up for that.

Some sections, though, amount to mere padding. Others, like the descriptions of applications software for business, may be relevant to only a few readers. But maybe that's the price you pay for completeness.

Moneywise, the price you pay looks a bit high for an all-purpose introduction. It's buying some very good presentation, layout and illustration: and on balance, it's worth paying for.

BOOK LOOK

The Commodore 64 Handbook



The Book:	The Commodore 64 Handbook
The Authors:	Peter Lupton and Frazer Robinson
The Publisher:	Century Publishing Co
The Price:	£5.95
The Reviewer:	Simon Potter
The Conclusion:	Not a handbook, but an uninspiringly ok introduction

If you were writing a book about the 64, you'd almost certainly call it 'Getting the most from the 64' or 'The 64 Handbook'. That at least seems to be the obvious conclusion from the flood of Commodore books hurtling like lemmings from the world's publishers. There are so many, in fact, that the average punter could well be forgiven for ignoring the claims in the title.

Book jacket blurbs and titles are becoming debased: you know full well that the book probably *won't* help you 'get the most from' your 64, or it won't be an all-you-need-to-know 'handbook'; instead it'll be another supplement to the 64's manual, introducing the 64 and expanding on those bits the manual glosses over.

The best you can hope for is that it will give you some extra information, or that it will help you quickly to locate some fact you need, or that it will demonstrate the use of the 64 and the commands available (a tenner to anyone who can tell me how, why, when and where to use WAIT).

And so to *The Commodore 64 Handbook*. Now, let's be viciously literal. A 'handbook' it seems to me should be a handy compendium: it should tell you all you might want to know (and I do mean *all*), and it should do so in a useful and useable fashion.

Strike one for Messers Lupton and Robinson. They've written yet another 'beginner's guide to the 64' that goes a bit further than the manual; as such it's not a *bad* try. A bit me-too in its nature and not particularly lively in its style, but still adequate. There are some oddities of construction, given that it *is* for novices: like the tuning screw at the back of the 64 is identified in the caption to a drawing (most 64 books ignore it) but the thing isn't mentioned at all in the section on tuning. You're told all about variables and arrays (heavy stuff for page 27, but quite well explained) *before* you're introduced to the use of cassettes (all part of the basics, surely). The TI clock, a genial extra in the 64, is introduced before the fundamental stuff like subroutines. And so on.

At the other end of the book are the usual appendices, most of them apparently reprinted *en masse* from the 64 manual. Which you'll have with your 64 anyway. To my mind, appendices should give additional information: why not a decent memory map, at the very least?

More crucially, the book has two significant deficiencies as a handbook. The authors simply haven't presented their information in an easy-to-use reference form (though end-of-chapter summaries and a decent index do represent a nod in that direction). They haven't covered everything – nothing about disks and printers, for instance, nothing about off-the-shelf packages either.

And sometimes what they do cover is cursory in the extreme: CMD is mentioned only in passing, and there's nothing about the alternative use of CMD or PRINT# in addressing I/O channels. You get a mere five pages in Chapter 16 on 'Advanced Techniques', though truth to tell it does contain a plug for something called 'The Advanced Commodore 64 Handbook'. Anyhow, the advanced techniques in question are machine-code subroutines (a less than helpful mention of SYS and USR): there's half a page on WAIT that concludes by saying the command is unnecessary: and there's a couple of pages on 'designing good programs' which mis-defines 'structured programming', advocates the use of some forethought, and omits any explanation of flow charting ...

What's worse, the book falls into the style of so many 64 books. Most of the examples are mathematical and many are pointless: surely there must be a better way of illustrating loops and decisions than a long program that sorts numbers into ascending order? Which leads on to a major criticism: like most 64 books, this one tells you a lot about Basic commands without explaining how, why and where you might actually want to use them.

The authors can't have it both ways: either the book is a reference handbook or it's a beginner's introduction. It succeeds as neither. As an intro to the 64, it's no worse and no better than a dozen alternatives: good sections on graphics and sprites, for instance, but iffy on sound.

Get the idea? Well, don't bother getting the book – not if you want to use it as a genuine handbook. As an intro, it'll do as well as any until something really good comes along ...

CHARTS

VIC 20 TOP 20

Pos	Move	Title	Manufacturer
1	Static	Crazy Kong	Interceptor
2	Static	Jet Pac	Ultimate
3	Static	Wiz and Princess	Melbourne
4	Up	Hell Gate	Llamasoft
5	Static	Snooker	Visions
6	NE	Sub Commander	Thorn
7	Down	Sargon II Chess	Commodore
8	Up	Flight 015	Ferranti
9	NE	Scramble	Terminal
10	NE	Chariot Race	Microantics
11	Up	Emmet Attack	Commodore
12	Static	Metagalactic Llamas	Llamasoft
13	NE	Dam Buster	Rabbit
14	Static	Arcadia	Imagine
15	RE	Matrix	Llamasoft
16	Down	Paratrooper	Rabbit
17	NE	Space Swarm	Soft Projects
18	Static	Gridrunner	Llamasoft
19	Static	Skyhawk	Quicksilva
20	NE	Mine Madness	Thorn

TOP 5 MANUFACTURERS:

LLAMASOFT
INTERCEPTOR
ANIROG
COMMODORE
IMAGINE

CBM 64 TOP 20

Pos	Move	Title	Manufacturer
1	Up	Space Pilot	Anir
2	Static	Manic Miner	Soft Projec
3	Up	Hunchback	Ocea
4	Up	Scuba Dive	Martech/Dure
5	Static	Chinese Juggler	Ocea
6	Up	Pilot 64	Abbe
7	Up	Forbidden Forest	Cosm
8	NE	International Football	Commodore
9	Down	Revenge of M'C's	Llamasof
10	NE	Quick Thinking	Mirrorsoft
11	NE	Aztec Challenge	Cosmi
12	RE	Hovver Bovver	Llamasoft
13	NE	Colossus Chess	CDS
14	NE	Speed Duel 64	DK Tronics
15	Static	Metagalactic Llamas	Llamasoft
16	Down	Boogaboo the Flea	Quicksilva
17	NE	Ugh!	Softek
18	Down	Super Pipeline	Tasket
19	Static	China Miner	Interceptor
20	NE	Splat 64	Incentive

TOP 5 MANUFACTURERS:

LLAMASOFT
ANIROG
OCEAN
INTERCEPTOR
TASKSET

An independent directory of best-selling games, compiled by R.A.M./C. for Commodore User, representing retail sales for preceding 4 weeks. Data drawn primarily from independent specialist computer outlets.

- Up — Going UP
- Down — Going DOWN
- Static — STATIC
- NE — New Entry
- RE — Re-Entry

Profile

Picking on Paramount

Bright ideas and bushy tails versus the money machine

by Bohdan Buciak

Paramount still thinks it can make a splash before the tide goes out. It is majoring on Commodore machines, has a small range of good games – and has acquired the obligatory teenage-genius programmer. With that lot, it confidently expects to turn over £1 million in its first year. Bohdan Buciak trekked to Teeside for a chat with Paramount's protagonists.

Paramount lives in a modest row of terraced shops in the modest town of Stockton-on-Tees. Across the road is the railway station from which Stephenson's Rocket used to trundle up the tracks to Darlington – Stockton is proud of that.

But Bob Horsham and John Chapman, Paramount's joint founders, aren't Stockton men; they're both from Yorkshire, and in the true brass-from-muck tradition they both describe themselves as entrepreneurs of sorts.

"My whole experience is in marketing and promotion – promoting people." The middle-aged Horsham reels off a list of areas he's worked in: jewelry and bullion, discos and clubs. Perhaps not the best pedigree on which to enter the specialised and often cut-throat software industry?

Chapman to the rescue: "But we're both natural businessmen and we know that if there's room for one there's room for another". That sounds pretty casual but a good deal of preliminary research was done, mainly by Bob Horsham ("I was having a lazy period – things weren't going too well for me in business"). Horsham found himself with plenty of spare time to look for new areas in which to exercise his promotional skills. "The idea of computers began to hook me and I knew there was an opportunity there ... if only I could find it."

Promotional ideas

He thinks he *did* find it, his idea being to promote games programmers as personalities: "I reckoned you could have an Elvis Presley of leisure software programming." (Horsham prefers 'leisure' to 'games' software – but more about that later.) "It was difficult to get my concept of promoting programmers over at the time – and John Chapman thought I was crazy." Of course, it's easier to swallow those ideas now that the likes of Geoff Minter and Eugene Evans have reached cult-figure status.

At the same time Horsham bought a Vic and then a 64; and he decided those were the best machines to write for – perhaps not from the technical viewpoint, but certainly in terms of selling prospects.

Horsham and Chapman duly combined forces and moved to Stockton where the latter had most of his business interests. But that wasn't their main reason for settling on Teeside: "We knew that Teeside Polytechnic had a good reputation for turning out computer people and the area was totally unexploited. So we placed advertisements for programmers in the local press."

They formed Workstations, a consultancy operation that arranged for ghost-writers to work for already established software houses. It seemed natural from there to go one step further and form a software house of their own. "We chose to call it 'Paramount' – sounded suitably impressive."

Setting up Paramount enabled Bob Horsham to pursue his dream of promoting and managing a genius programmer: "we interviewed a lot of people". Most were youngsters who, according to Horsham, wouldn't or couldn't fit in with his plans: "I wanted an old head on young shoulders, somebody who could be successfully *managed*".

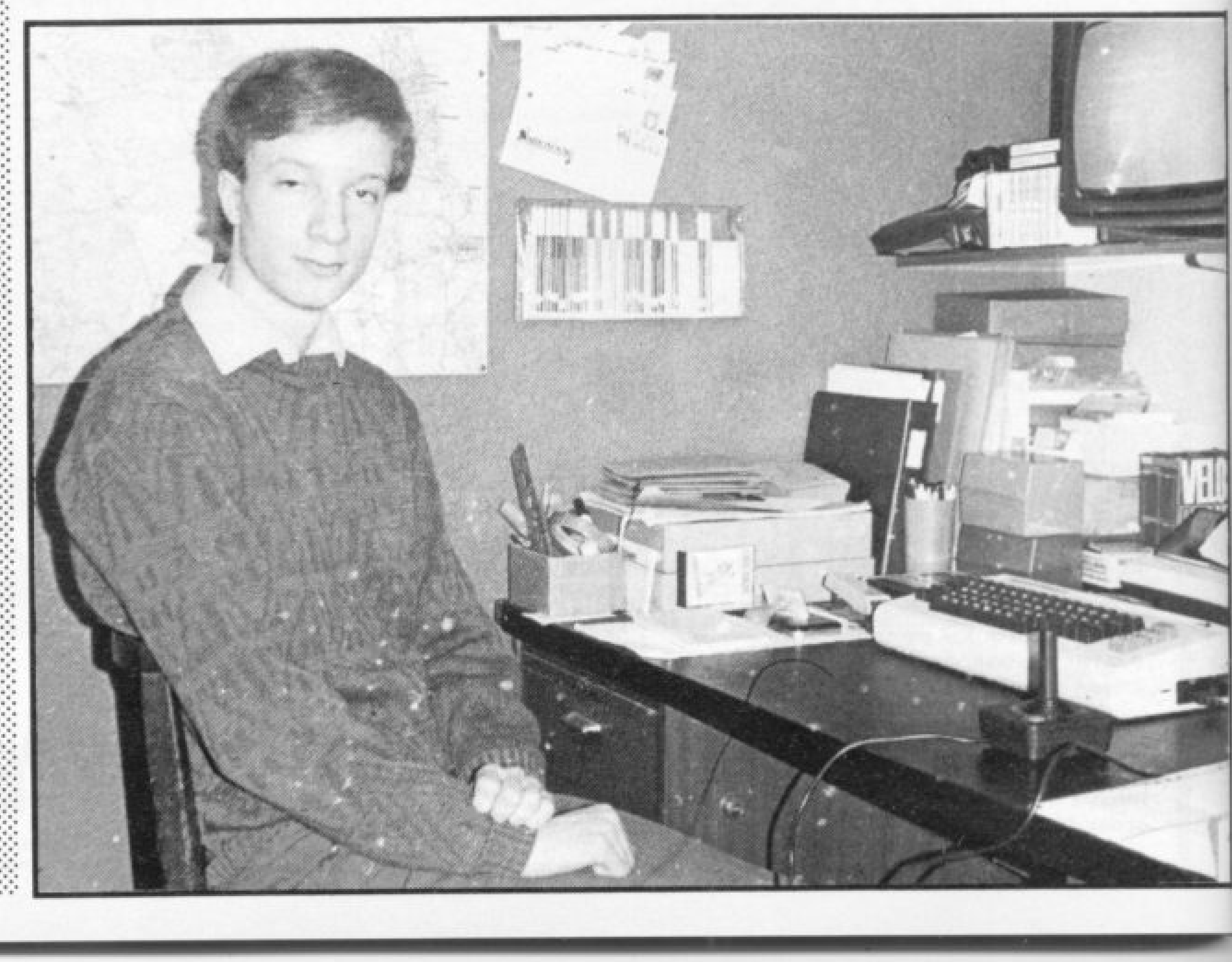
A star is born

Paramount eventually found three programmers. Only one of them looked to Horsham to have star potential – a sixteen-year-old school leaver with the unlikely name of Jason Benham.

Jason started work on the Vic and produced *Outback*, an original yet somewhat bizarre game featuring the likes of swagmen and kangaroos. That was Paramount's first product – it appeared last November. Since then, Jason has written *Jogger* (a 'Frogger' clone for keep-fit enthusiasts that seems to sell despite the longevity of the basic idea) and *Chocabloc*, also for the Vic. For the 64, he's converted *Outback* and written *Megawarz*. That amounts to all but one of Paramount's current title range – pretty good going.

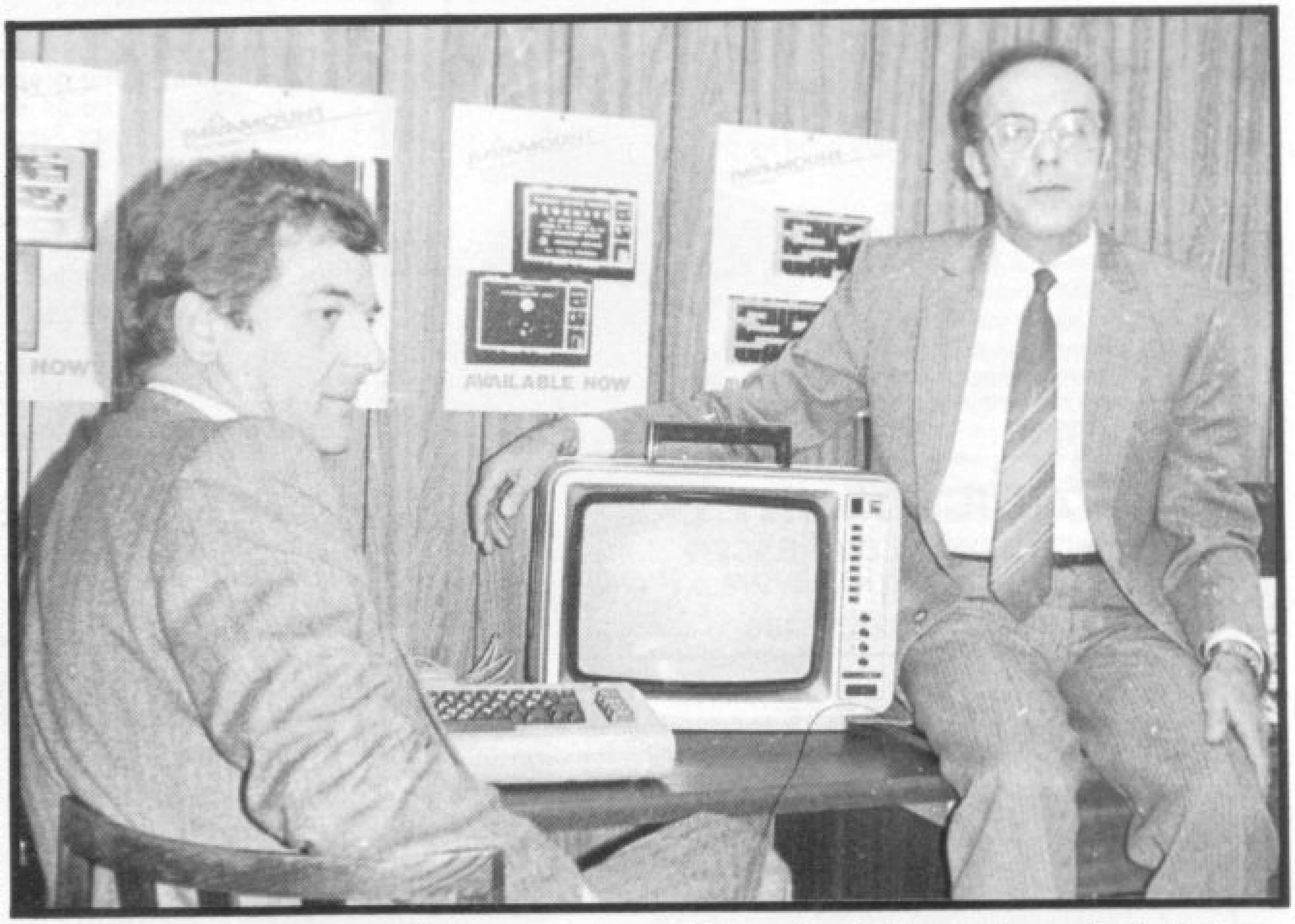
Jason had to accustom himself to Paramount's ways of working. His first version of *Outback* wasn't accepted straight away. Both Horsham and Chapman made suggestions which, fortunately, Jason was able to implement himself. *Countdown* (the only Commodore game Jason hasn't written) was different; the teenager who'd originally submitted the program couldn't revamp it himself.

That was where the technical expertise available at Teeside Poly came in. "We employ computer scientists on a freelance basis to modify programs and give advice," says Horsham. So why don't these people write their own



Just what the world needs, another games company. Paramount Software is pretty small and pretty young compared with the giants of the games software industry, who started shovelling out games and shovelling in the money a long time ago (which means all of two or three years). Now, the games market is reaching saturation point and it looks as though only the large concerns with the financial muscle will come out winners – money matters like 'distribution' and 'marketing' count more than the quality of games in this business.

The Commodore User Profile



programs? "Computer scientists have a lot of routines but don't tend to have finished programs." What he's saying is that the youngsters usually have the original concepts, the creativity; but they may lack the technical ability, the logic or even the patience to turn that idea into a good game. And equally, that the established computer professional may be able to do it right – but lacks the original ideas.

Paramount is keen for local youngsters to come in and get their work assessed. It's now making alterations to its modest offices to accomodate them. But kids aren't given the opportunity to discuss their work with technical experts. "We can't send kids away with development ideas because that's chucking away our commercial secrets", confides Chapman.

That's followed by: "We find they don't get on anyway – kids don't seem to be motivated by the really technical stuff". That may or may not be true. Youngsters could certainly benefit from talking to the experts. But there *is* a premium on originality in the software industry. Letting secrets go is bad business – even if it does sound a little callous.

So the premise is that the youngsters will have the kernel of an idea and Paramount will try to mould it. "We know what we want the finished product to be but not how to do it. Sometimes we make demands that technically can't be met. But it's always a team effort." Jason has probably experienced that way of working more than most.

Rich pickings

Bob Horsham has strong views on that team-spirit idea. "I can only work with people who are willing to be managed, with whom we can work towards a common aim on a long-term basis" (that aim is obviously wealth for all concerned).

It might sound as though Horsham's interested only in people who will do as they're told. He denies that strongly and points to the often deluded get-rich-quick visions youngsters seem to have about the games software industry. He's probably trying to be more cautious when he makes the admonition, "you don't make a fortune overnight". Even if some people demonstrably have done just that ...

So what kind of money do programmers make at Paramount? The company generally employs them on a freelance basis and they receive only a royalty on sales. That lies between 10 and 20 per cent, depending on how much development was done by Paramount on the original idea. Jason, being the company's whizz-kid, is paid a fee: but he's not rolling in money.

So Jason's had to put aside ideas (if he ever had them) of quick bucks on the Eugene Evans scale. He probably works hard and has to undergo the additional strain of changing from the Vic to the 64. "That was the make-or-break period of our relationship," remembers Horsham. "We tried to give him a lot of backing and spent a great deal of time at his house."

While Jason was struggling with the 64 version of *Outback*, Horsham suggested he take a break and work on something else. That was how *Megawarz* appeared – a somewhat classier version of those spaceship zapping games. And like Jason's other games, it has received good reviews in the computer press: it's also become Paramount's best-selling product with sales of 60,000 expected by the end of April.

Getting noticed

A string of good reviews have doubtless been a boon to Paramount. But despite Jason's talent, if those games don't appear in the shops the customer won't be able to buy them and Paramount makes no money. But there's the paradox that dealers won't stock you unless somebody else is stocking you. So how does a small company get itself noticed and its products on the High Street?

One answer for Paramount might have been mail-order. But Horsham recognises that the bottom has fallen out of that – and so has customer confidence. Too many software houses in the past have 'forgotten' to meet their customers' orders.

In any case, you don't sell many games that way. And he wants to sell a *lot* of games. So Horsham has a sales force of three; they travel the country visiting as many dealers as possible. That's backed up with an advertising campaign in the computer press.

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some of the national chain-stores. Of course, that's where the big sales start; distributors buy in bulk and guarantee to get your tapes into a large number of shops – on a national basis. "Softshop, Pilonmist and Websters now distribute us. We're in Boots and Menzies too; but to get there, we had to bombard them with reviews, literature and reports from customers."

There's a price to be paid for selling in bulk to chain-store or to distributors. Both expect large discounts, the latter taking as much as 50 to 60 per cent of the tape's retail price.

Paramount's games are selling well. But both Horsham and Chapman realise that to be successful, their games must continue to be original: and they must push further towards the computer's technical limits. "We're constantly looking at other people's games, especially those new on the market, to assess the State of the Art." Horsham says that recent games offerings from large concerns have left him cold – "Taskset is the only other software house we're watching closely". That company happens to specialise in games for the 64 (*Super Pipeline* and *Jammin'* now appear at the top of the 64 pop-lists).

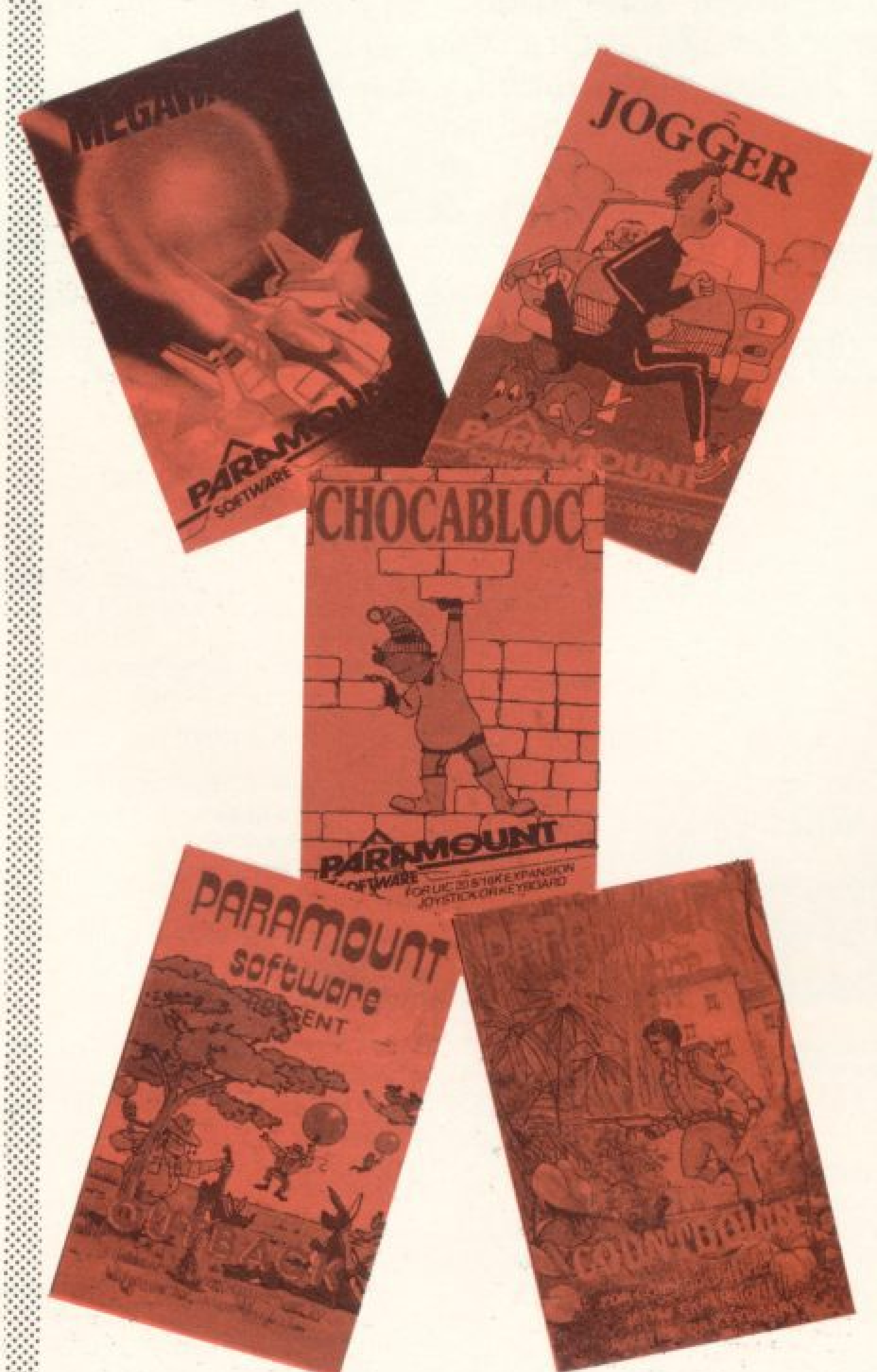
Developments

Paramount is characteristically cagey about its new games developments. Apart from acquiring someone to rewrite existing games for other machines, the Spectrum in particular, it's looking for what Chapman calls "vastly more complex games." What that amounts to he is loathe to reveal, except: "we're developing a Commodore 64 game that uses 42K, about 7K more than the machine's useable RAM, by getting into its dark corners".

Loading such a lengthy game from tape will probably tax your patience. So providing games on floppy disk, as the likes of Isis Hathor and Audiogenic are already doing, may be a good (and necessary) idea? "At present it costs more and we'd have to pass that on to the customer. But we will be manufacturing disk-based games by the end of this year."

Will the games market in its present form last that long? Both Horsham and Chapman have strong views on that: "Leisure time is going to increase," observes Chapman (he doesn't like the word 'unemployment') "and people will require something to do that is not only leisure but constructive". That's why they prefer 'leisure' to 'games' as a description for their wares.

Over to Horsham: "We realize that the market is diversifying into home and educational software. But we're not impressed with what's available so far, and it's not worth selling on the basis we've seen. It will take us a long time to dig out and produce our own. And, at present, we just haven't got the time." It's a matter of priorities; Horsham would rather open up overseas sales of existing products than diversify into unchartered waters.



Whatever the software, though, Paramount is staying with the Vic and 64 as its main machines – and probably with any future machines Commodore decides to launch. The Vic is already beginning to suffer from a scarcity of new games. But Horsham is sticking with it, and says his Vic games are selling well; "we will continue to produce games for the Vic because it's got such a large user base." And the 64? "It's absolutely first class – ideal for what we want."

Master plan

And what Paramount wants, according to Horsham, is to be in "the business of winners. Unlike the rest, we don't produce one good game and a load of bad ones. We have only eight games and they're all good". Which is for you, the customer, to decide. But what he's saying is that going for quality rather than quantity makes better business sense.

Horsham's idea of winning is linked to his idea of promoting and managing personalities. "Two or three of our programmers will become Big Names – one of them will be Jason Benham. He knows that everything we said *would* happen *has* happened." Not too surprising since Horsham now manages Jason's affairs personally.

"As of now", he enthuses, "Jason will be getting gradual and co-ordinated exposure in the media as a whole; in magazines, radio and ultimately on television". But is Jason ready for the likes of Terry Wogan? And what will he actually do under the bright lights? Horsham has no doubts on either count.

"We don't want to push him out too soon. So we've gradually involved him in a pseudo-social life and people have noticed that he's coming out of his shell. *Outback* and *Megawarz* have also given him a great deal of confidence. You can't promote a guy unless he's going to be able to do something – we see Jason contributing to computer magazines, and computer programmes on both radio and TV." – all this, he hastens to add, with complete parental consent.

In the short space of time Paramount has existed, Horsham has laid the foundations for his Plan and he's confident that the youthful Jason Benham will fulfill the promises made to him. "Jason's got the ability to understand exactly what I'm after; he has the original concepts but he can also listen to what I'm saying. As a result, he's achieved what I consider to be the ultimate in programming." So Jason's future stardom is assured? In any case, whatever the success he grabs, it looks as though he'll achieve it the Horsham way. ●

Basic Style – Program Evolution

by Jim Butterfield

Sometimes you see programs that are so crisp and neat that you wonder how the programmer's mind can be so orderly. The code comes out in an elegant incisive style. Every line zeros in on exactly the right thing to do.

How does a programmer develop such a style? Why can't you write like that? Sometimes a lowly hacker can feel inferior when facing such immaculate programming style. Yet the code you see is often a matter of evolution – rewriting and tidying up. It's not always written that way from the beginning.

I have been accused of writing 'squeaky clean' programs. It seems to me that you might like to see how my mirky first programs get reworked and tightened up into their final version. It seems to me that in some ways, programming style isn't what you write (at least at first) – it's knowing what to look for when you clean up.

I need to do an almost trivial job – list a file from disk to the printer.

I had a minor extra to do: I wanted individual pages, so that the lines needed to be counted; I needed a title on each page; and at the end of the run, for the sake of neatness, I wanted the printer to eject the page.

It's not a demanding task, but I'd like to show you how I went about it. In particular, even a simple job like that can be revised and tightened up extensively.

Here's my first program – I'll talk my way through the listing.

```
100 OPEN 4,3
```

Open file number four to the screen. Why? So I can send the program's output to the screen and see that it's working right. After the program looks good, I'll change the above line to OPEN 4,4.

```
105 OPEN 1,8,3,"CONTROL"
```

That's my input file to be listed.

```
110 REM start of page
120 FOR J=1 TO 2: PRINT#4:L=L+1:NEXT J
130 PRINT#, "     title     ":L=L+1
140 PRINT#4:L=L+1
```

This prints the page title. I know I'll come back here for each new page, so I'm placing a REM statement here to mark the place. I rigorously add 1 TO the line count, L, each time I print a line.

```
150 INPUT#1,A$:SW=ST
170 PRINT#4,A$:L=L+1
```

Here's where I input from disk and output (to the screen first, later to the printer). I need to save the value of ST (the status variable) so that later I can check to see if this is the last line from the file. ST will be changed by the PRINT# command ... so I save its input value in variable SW.

```
180 IF L<62 GOTO 250
190 IF L=66 THEN L=0:GOTO 250
200 PRINT#4:L=L+1:GOTO 190
```

If I have printed the maximum number of lines desired, I want to eject the paper by printing until the line count L equals 66. Since each page has 66 lines, I'm now at the start of the next page and can set L back to zero.

```
250 IF SW<>0 GOTO 300
260 IF L=0 GOTO 110
270 GOTO 150
```

If I'm at the end of the input file (SW=0) I'll go to line 300 and wind things up. Otherwise, I want to go back.

Here's a cute touch – perhaps too cute for some tastes. Variable L can only be equal to zero if I've just ejected a page. If not, get another line from the input file starting at line 150.

```
300 IF L<>0 GOTO 190
```

Here's a super-cute trick. I pondered this one for a while, since it's almost too clever; that sort of thing can trip your coding up. Here's the objective: if we're finished, but the paper hasn't been ejected, get back to line 190 and eject the paper. The coding will come back here again, but this time variable L will be zero and we can finish the job by closing the files.

```
310 CLOSE 1
320 CLOSE 4
```

That's it. It's really rather messy coding. It works, and for a temporary job that's all we would need.

But it doesn't "feel" right. The code feels messy: it seems to jump around and I don't get a feeling of smoothness in the program. It's time to pick at the coding.

First revision

The first awkward spot is around lines 190 and 200. The code to eject the paper works but looks clumsy. Besides, we call it twice (once at 62 lines, and again at end of file).

I have feelings about this part of the code, too. It's a 'unit' to do a particular job. I would feel better moving it to a separate subroutine where it can stand out as an identifiable action. Sometimes I extract code into a subroutine and then move it back later; it helps me identify the 'modules' that make up the program.

Let's move the eject routine to a subroutine at line 500, clean it up a bit, and see what we get.

We can see that the GOTO 250 on line 190 is now redundant since we'll go there anyway. But we have other things to do. We're still trimming the program, and have some distance to go yet.

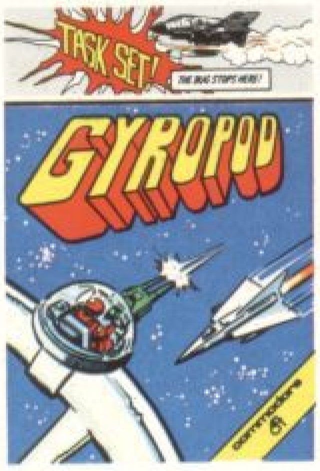
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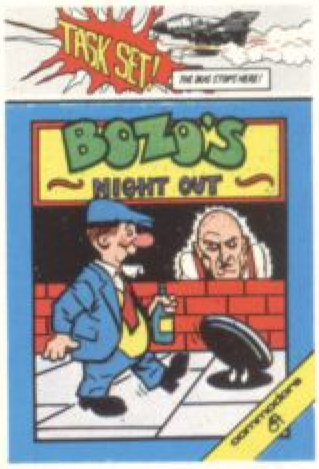
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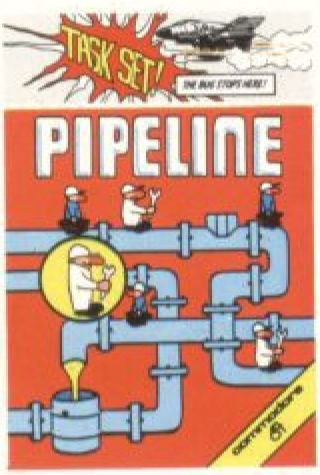
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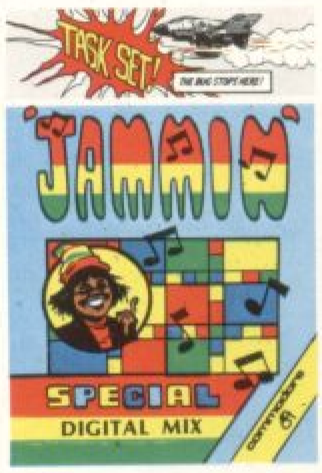
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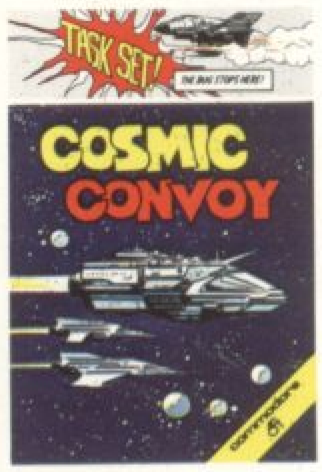
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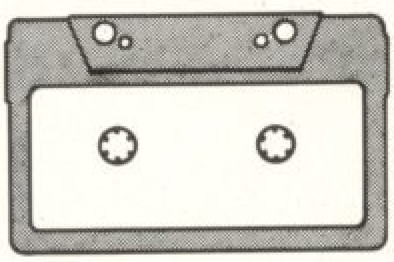
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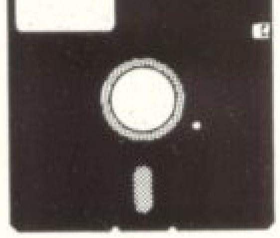
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```
100 OPEN 4,3
105 OPEN 1,8,3,"CONTROL"
110 REM start of page
120 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
130 PRINT#4,"     title      ":L=L+1
140 PRINT#4:L=L+1
150 INPUT#1,A$:SW=ST
170 PRINT#4,A$:L=L+1
180 IF L<62 GOTO 250
190 GOSUB 500:GOTO 250
250 IF SW<>0 GOTO 300
260 IF L=0 GOTO 110
270 GOTO 150
300 IF L<>0 GOTO 190
310 CLOSE 1
```

Digging deeper

Around lines 250 to 270, we jump around a lot: we have one jump forward to 300 and two jumps back to 110 or 150. The logic seems scattered.

I have a thing about loops: I like to see them neatly nested, with short jumps entirely within longer jumps. It might even be summarized as a rule-of-thumb: where possible, make short jumps as short as possible.

Using this rule, I want to get the loop back to 150 into logical order first. Then we'll work in the longer loop to 110, and finally the forward branch to 300. We'll need to expand the logic using an AND operator, but that's not too hard.

As the coding is written, certain logical things start to fall together. For example, we don't have to GOTO forward to line 300 ... when we're finished writing the two loops, we'll fall into 300 naturally. ('Naturally' seems to be a key word in how programs seem to come together as you tighten them up).

We can also tighten up the page eject conditions. If we write line 180 correctly, there will be no need to go back to get a page ejection. One option would call the subroutine at 500 twice. But if we think of what our objective really is at line 180, we can do it all correctly the first time through. Inverting the logic and adding an OR connective does the trick nicely.

Look at how far the original program has come:

```
100 OPEN 4,4
105 OPEN 1,8,3,"CONTROL"
110 REM start of page
120 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
130 PRINT#4,"     title      ":L=L+1
140 PRINT#4:L=L+1
150 INPUT#1,A$:SW=ST
170 PRINT#4,A$:L=L+1
180 IF L>61 OR SW<>0 THEN GOSUB 500
250 IF SW=0 and L>0 GOTO 150
260 IF SW=0 GOTO 110
310 CLOSE 1
320 CLOSE 4
330 END
500 FOR J=L TO 66:PRINT#4:NEXT J
510 L=0:RETURN
```

This is pleasing ... but we can do even more. The repeated SW=0 test in lines 250 and 260 still irks a little: it seems clumsy. The whole business is tied up with whether to print a title or not. Is there a better way? Could the test of L>0 be somehow shuttled up to the top of the loop instead of sitting at the bottom?

While we're thinking about it, the whole business of printing a header is really a module – we must do the whole thing, title and all, or nothing. If we move it out to a subroutine, we might see the logic flow more clearly. Let's do it and work on the logic flow. We end up with this:

```
100 OPEN 4,3
105 OPEN 1,8,3,"CONTROL"
110 IF L=0 THEN GOSUB 600
150 INPUT#1,A$:SW=ST
170 PRINT#4,A$:L=L+1
180 IF L>61 OR SW<>0 THEN GOSUB 500
260 IF SW=0 GOTO 110
310 CLOSE 1
320 CLOSE 4
330 END
500 FOR J=L TO 66:PRINT#4:NEXT J
510 L=0:RETURN
600 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
610 PRINT#4,"     title      ":L=L+1
620 PRINT#4:L=L+1
630 RETURN
```

Look at the main code from lines 100 to 330. It now seems tight and concise like a finely tuned instrument.

Both subroutines – at lines 500 and 600 – are called only once. If it seems important, we could put them back into the main coding stream. But I'm happy to see them as clearly isolated modules. At this stage I would add comments (line 499: REM PAGE EJECT and line 599: REM TITLE PAGE) to neaten things up.

Moral

First: what you see published is not always the first coding idea that popped into the author's head. The programmer is not always smarter than you. But more time has been taken grooming the program into its final shape. When many people are going to read your code, you like to take a few extra pains with its appearance.

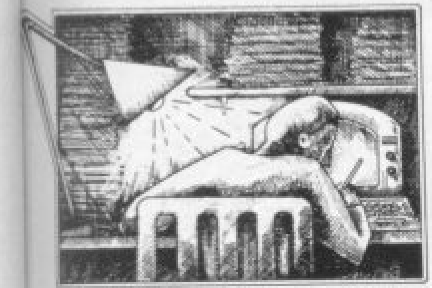
Second: don't be afraid to revise your programs, even if they work correctly. Sure, a one-shot program often doesn't warrant picking over; use it and forget it. But sometimes the exercise can reveal – almost accidently – powerful and effective ways of coding.

Third: – 'style' isn't an inborn talent that some people have and some don't. You learn it as you go. Some things you will discover for yourself, and others you'll pick up by looking at other people's coding.

The odd thing is that we instinctively recognize better coding when we have written it. You may not know exactly why, but you often feel good about a certain piece of programming. Usually, it's because it has 'style'. But remember that style isn't a matter of luck. You can get it by working for it.

TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wadge of priceless information and indispensable advice. There's even the odd useful tip as well.



Dear Tommy, I am at the end of my tether. It seems that I am totally unable to get an answer from Commodore to my problem. I have a Vic-20 and a Brother CE60 Electronic Daisywheel Typewriter plus its IF50 interface and its CA50-5 cable set (the machine accepts RS232 or Centronics). The lead has a D-type 25-pin plug; the Vic does not. How do I use the Vic-20 in RS232 to drive my word processing equipment? Why don't Commodore tell us more about the RS232 of the Vic, or is it all a filthy lie?

Before you can connect a printer to the Vic using an RS232 link, you need an RS232 adapter for the Vic. Surprised? Well, the Vic does not really have an RS232 port – it's so-called "RS232" port is software-compatible with RS232, but it needs some extra *hardware* to convert the Vic's signals to the different voltage range required.

Stack (among others) does a very good interface. Unfortunately, buying one of these means your problems have now only just started – because very few hardware manufacturers implement the complete RS232 specification, except for full communications devices like modems. Instead, each company takes what it considers to be a reasonable subset of the standard. The result? Trying to connect two different devices, each using a different subset of full RS232, can be an absolute nightmare.

In addition, some printers use special characters sent up and down the line to tell the computer when they are unable to accept any more data (printers are very much slower than computers and so the Vic needs to stop every so often to allow the printer to catch up).

Now, the cable you already have may well work; if not, hopefully, the interface manufacturer may be able to give you the required connections if you can send him the details of the Brother Interface. But don't expect it to work first time, unless you can find somebody else who has successfully connected the same printer to a Vic. It can take even an expert some fiddling to get an RS232 link working properly, and trying to do it by post is much more difficult!

Dear Tommy, The display on my 64 is flickering whenever the computer is parked in an INPUT or a WAIT or similar endless loop. Small twinkles appear around characters like 'D','E' and 'F', although the rest appear normal. But if the character set is moved to RAM, all characters appear normal and without flicker. What could be the cause of that?

The 64 also seems to have a strange bug. Press both cursor control keys permanently and then press the left-hand shift key. You should then be able to observe some spades on the screen, if yours has the same bug.

The first problem sounds like a hardware fault, but it is very difficult to think of a cause without having the machine look at. It sounds as though maybe the character generator is borderline. It is unlikely to be a serious problem though.

Your second point is something I had not noticed before – presumably it is something to do with the keyboard decoding on the 64.

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Dear Tommy, I have been trying to write a 'Monopoly' program for my 16K Vic. The information about each street, rent, price of houses etc. is stored in DATA statements – for example:

```
10  DATA 200,0,0,0,0,0,0,0,GO
20  DATA
    0,2,10,30,90,160,250,50, OLD
    KENT RD
```

These lines are perfectly legal as far as I can see, but when I run the line ...

```
1000  READ
      D(I),P1(I),P2(I),P3(I),P4(I)
      ,P5(I),P6(I), S£(I)
```

I get a SYNTAX ERROR. Why?

Now for something completely different. When I run the following program a STRING TOO LONG ERROR IN 20 is detected, even when the string length is only one character long:

```
10  OPEN 1,1,0,"DATA"
20  INPUT#1,H£,S£,T£,C£,TL£
30  CLOSE1
```

This has puzzled me: the manual says the maximum string length is 255 characters.

And finally, can you tell me the machine code instructions needed to find a random number?

The SYNTAX ERROR in a DATA statement is caused by trying to READ a character value into a numeric variable. The lines in your letter look all right: but are you sure you haven't got a letter 'O' instead of a digit '0' somewhere? It is very easy to miss out one value in a string of DATA items, so that the READ statement comes to an alpha character while it is still looking for a numeric one.

The maximum length which can be assigned to a string is indeed 255 characters, but the maximum length which can be INPUT is only 80. If you are inputting several values with one INPUT statement, each value in the record must be separated on the tape by a comma. A typical line to write this data would be ...

```
100  PRINT A$,",",B$,",",C$
```

To produce a random number in assembly language use one of the following calls as necessary:

JSR E09B equivalent to RND(0)
JSR E0BB equivalent to RND(1)
JSR E0D0 equivalent to RND(−1)

In each case the random number in the range 0 to 1 is left in normal floating point form from $8B to $8F.

Dear Tommy, Could you please tell me if it is possible to get programs written on the Vic to run on the 64. I am considering upgrading to a 64 and I am wondering whether I could adapt the programs I have written on the Vic without too much difficulty.

It all depends upon how you have written them. Basic programs should run without too much trouble (provided you have not filled them with PEEKs and POKEs) because the two Basics are identical. The major change here is to accomodate the fact that the 64 has a 40-column screen, so you will want to alter your screen displays to make them look nice with a different format.

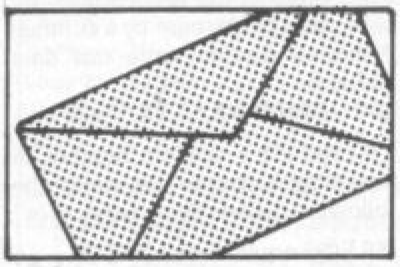
It is the PEEKs and POKEs which, as always, cause the problems. Fortunately, Commodore have gone to some lengths to make your job as easy as possible here. POKEs into locations below 1024 are likely to be unchanged. The screen memory now starts at 1024, and the corresponding colour area is 55296.

The procedures for high-resolution graphics and sound have changed completely, though, so you will have to look up the articles in **Commodore User** dealing with those; but as the 64 is so much more powerful in these respects you would probably want to modify your programs anyway.

Letters

Write away

This is your page: normally we write for you, but here we listen. Feel free to let us know what you think – about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.



About ANIK

In your February issue you carry an advertisement for Anik Microsystems Software; the advert says your games will be sent within 48 hours. I think you would like to know that in answer to a similar advertisement I ordered *Yahtcee* on 10 October 1983. I see from my bank statement the cheque was cashed on 14 October.

As I did not receive the software I wrote to Anik in December but as yet have not received a reply. Since Christmas I have telephoned five times; three of the five times a youngster has answered and said someone would ring back – they never did. On the other two occasions a woman answered; the first time she said it would be attended to the following day – it wasn't. The next time she said she remembered passing on my message to Mr Andrews and she would tell him again.

It is now nearly five months and my letter and telephone calls have been ignored.

I think you should know that the advertisement your magazine is carrying only results in people losing money instead of receiving the goods they ordered.

R.A. Riste, 43 Easter Road, Kinloss, Forres, Morayshire IV36 0FG

This is only one of a number of letters we've received about Anik. Reluctant to condemn anyone without giving the chance to respond, we have been trying to get in touch with this company by letter and phone for two months – with no effect.

We are not accepting any further advertisements from this company. We advise you not to send it any money. And anyone who has lost money by ordering games from Anik is recommended to drop into a Citizens' Advice Bureau and ask about Small Claims in the County Court – a cheap and easy way of taking a defaulting supplier to litigation.

Devaluation

I read with interest W.J. Howard's remarks concerning the devaluation of his Vic and your reply.

I bought my Vic in January 1983 after reading your December 1982 article which had influenced me a great deal. I had felt that with the possibility of this (now mythical) offer I shouldn't lose much. I went on to buy all Vic expansion – including expansion board and printer – feeling that if a company was prepared to consider its customers they had a right to further support.

My naiveté has been a little costly on my pocket and I now find that to try to sell entails almost giving it away. My decision is to hang on to it and save for a different make of machine: I shall certainly not buy Commodore products again. Its sales tactics over the Vic have left much to be desired.

My attitude to your mag over this experience was also wary and when it became more and more 64ish I began to groan and decided enough was enough; however this month's issue has restored my faith somewhat and I am digging into my well-worn pocket to see if I can find enough pennies to make up £12. I also find your mag invaluable for software addresses, as living outside the UK obtaining software is sometimes a bind.

Which brings me onto the request. Is it possible to review more useful software than the multitudinous games? Or better still, as well as? I have at present the *Home Office* word processor which for its price is great value: however, I could do with something more sophisticated. I would also like a spreadsheet. I realise that what I am after are business applications; is there any hope for my little machine? (Should you have covered this last request my apologies for while I was dithering on whether to renew or not to renew I missed several copies.)

Oh, just to round off, can anyone tell me why when using the *Home Office* with the 1525 printer does the whole shebang hang up on me on the second copy? It happens usually after making amendments to the master copy and justifying again.

Mrs V Yates, BFPO

Dear old USA

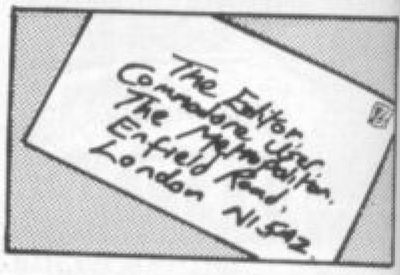
Being completely new to computing I rely heavily on reviews of games software before making a final choice for my 64. After trying various mags I have settled for buying **Commodore User** regularly; so could we please have more games reviews?

Now to the real reason I'm writing. Some software houses are advertising American games software. What is baffling me is why the games are so expensive. They range anything from £20 to £40 per cassette. *Why?* Is it because their games are far superior to our own British games, or more complicated? How do you know what you are buying? Having not seen a review of any American game, I for one would never part with so much money to find out!

So could you please explain the reason behind such high pricing of games software from the USA?

M.J. Wiles, 197 Henllys Way, Coedeva, Cwmbran, Gwent, South Wales NP44 7LB

Suppliers tend to attribute the price vagaries to import duties, the risk of buying large quantities at a time, and the uncertain exchange rate (if you order $3,000 worth of something when you expect it'll cost you £2,000, and then the rate changes so that it'll cost you £2,800, it can make a big dent in your profit plans). But in general we agree – US games in Britain shouldn't be so expensive. After all, British software in the States isn't marked up proportionately.



Simply good sense

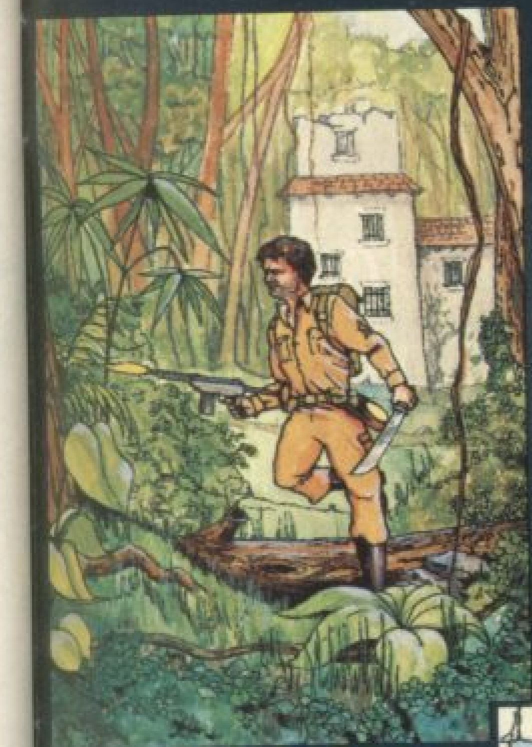
I don't ask you to print this further correction to the review and subsequent comment on our *Simply Write* program, and I don't want to upset a reviewer who will, we hope, review more of our products in time to come; but I do feel that your heading and Chris Durham's reply to my letter in the February issue imply that I am a liar. I am not happy about that.

Chris Durham's "... I noted a number of changes, some of which are additional calls on the error checking routine" is a contradiction of my letter and a blatant mis-statement of fact. If you are going to allow your own staff to have the last word in such a matter, then you have a responsibility to see that what they say is not derogatory or misleading. In fact, the only change made in the error checking in the correct version sent after the review was that an 'IF DN<>4 THEN', which had somehow been lost in the particular master used, was replaced WITHIN the error checking routine before a RETURN. I enclose a letter from one of our many satisfied customers which confirms that the error checking already existed in the program, and that he was surprised to see your misleading review.

While I applaud the editorial independence that keeps reviews and advertising distinct in the majority of British magazines, I do feel that it would be a good idea if you were to check your conclusions with the producers of the goods before publication. After all, quite apart from the relatively rare occasion such as this when a bad copy is received, it is a rapidly

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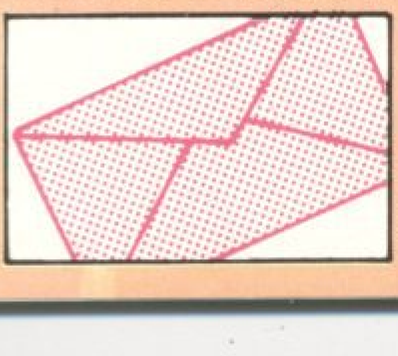
changing market. Continual tweaks and improvements are made to software by companies trying to give their customers good value, and one frequently sees products slated for shortcomings which have already been put right, or for not having some feature which has been added since the review copies went out. Also, this lack of communication with the supplier regarding problems is quite uncharacteristic of the situation our users find themselves in, as borne out by the second customer letter attached. I should add that this customer's problem is after some years of using our software, and has only arisen on his changing equipment.

Genuine user reviews would also be a decided step in the right direction. We get very irritated by reviews of programs (not just our programs!) in which the reviewer complains that the program does not have this or that nice feature found in some other program, or has only ten thousand variations instead of the ten thousand three hundred and seventy one of program X. Specialists seem to find it hard to understand that there are many users who want fewer features, not more, as long as they are the right features. All programs are based on a set of compromises, and few magazines take into account whether a program has been properly balanced for the group it is actually aimed at, or how satisfied actual users are. It is easy and mindless to go on adding new features to a program. Knowing where to stop before it gets too complicated for the ordinary user to enjoy using it is a grossly neglected part of the skill of programming.

This penchant for complexity and novelty in software is closely related to that attitude of mind that makes magazines treat the latest as the greatest, so that thousands of ignorant people rush out and buy a theoretically better machine that has no software, no peripherals other than on paper, and no background of user expertise or documentation. Computing for some people is not a lot of gee-whizzery, but a simple wish to get on with various jopbs more efficiently.

Misleading reviews, whatever causes them, do not hurt the product, they also hurt your magazine. Every user of *Simply Write* who reads your review knows that it does not properly describe the program he or she uses; and each will view with some lack of confidence your future reviews of other products. Every reader who did not know the program has been to some extent put off buying it, which means that our advertising in your magazine may achieve less over the year than the same amount spent in some other journal. We would not be so crass as to threaten to withdraw our advertsing, or even to want to do so after such a long and co-operative association. but we cannot ignore comparison of returns when we are planning future outlay. We know also from correspondence on the subject that your review was directly responsible for our not receiving a re-order from a foreign company whose last order amounted to over £1,500, as well as anxious letters from other foreign distributors who have been happily and profitably selling our products for months past. We should have to be pretty thick-skinned not to feel upset about that.

Brian Tregar, Simple Software Ltd, 15 Havelock Road, Brighton, Sussex BN1 6GL



Systems of romance

Strange this feeling, as the computer age has heated up. It's a feeling that as an intricate part of life on this planet I have been given the right to own such power, lying at my very fingertips. Just under the keyboard lies a brain more complicated than most humans can comprehend.

Yet that power is only intrinsic; the *real* power remains in the biological organism of the computer which designed the close running companion the microprocessor, that of the human brain, a conglomeration of thinking power resulting in the ultimate of man's tools, capable of guiding him even into deep space.

Now that I am part of this 'System of Thinking', I am bewildered at the way it has changed and is continuing to change the society we live in. I feel that every time I mention to friends and colleagues that we (wife and daughter included) have acquired one of those dark mysterious machines, their view of us changes. The usual comment being: "Oh I don't understand those things, what do they do anyway?"

As we all know computers are like dumb waiters, "they can't do anything by themselves, without a human operator putting in info". Knowing this takes away none of the awesomeness of the feeling of power I get every time I key in relays at the speed of light down microscopic channels to command centres ready to obey, in the right sequence, of course.

For me Walt Disney's "Tron" was more than fantasy; I thought it was in every way analagous to the computer and operators that generated the major graphics animated into the movie. The computer and the human brain is a two-way communication system intersected at the keyboard. Feed back being generated audio/visually. Are we instructed by the m/c or are we instructing the m/c? Do we as in Tron, enter the computer through the screen, the keyboard being our passport?

Meeting the new challenge for me is fascinating. The new frontiers are now in sight, dialogue from both sides continues to be understood – the future, well who knows

R Stammers, 9 Burnley Hill Terrace, Stone Chair Shelf, Halifax HX3 7LQ, West Yorks.

P.S. Sorry I haven't mentioned the mag or included any comments such as great type set, or keep us, the users, happy with more absorbing helpful information etc etc but rest assured as long as it, the mag, remains in the above state I'll keep buying it, ok.

Endless manic miners

If there is anyone who has Software Project's *Manic Miner* on the 64 and is unable to get anywhere on three lives, here's the procedure to give *unlimited* lives.

Rewind the tape.

```
Type  VERIFY
      LOAD"",1,1
      POKE 16573,234
      POKE 16572,234
      POKE 16571,234
      SYS 16384
```

It was easy enough to work this out using the Macro Assembler Package from Commodore (which is excellent). Anyone wanting to convert programs to disk, here are four tips.

Find the start and end addresses of the program just loaded off tape with:

```
?PEEK(175)*256+PEEK(174)
  (end)
?PEEK(194)*256+PEEK(195)
  (start)
```

Save with a suitable monitor. If program lives under the Basic ROM, switch it out using the monitor by:

```
.A 02A7 LDX #$36
.A 02A9 STX $01
.A 02AB BRK
.A 02AC
.G 02A7
```

And then save it, re-load with LOAD "name",8,1. Also try saving the tape buffer with .S"name",08,033C,08PC from your monitor.

I am starting a 64 division of a Spectrum club at Ounsdale school dinner hall, Wombourne, West Midlands on Mondays at about 7pm, if anyone is interested in the area. We will be at the Midland Computer Fair at the NEC.

Nigel Wilcox, 56 Windsor Gardens, Castlecroft, Wolverhampton WV3 8LZ

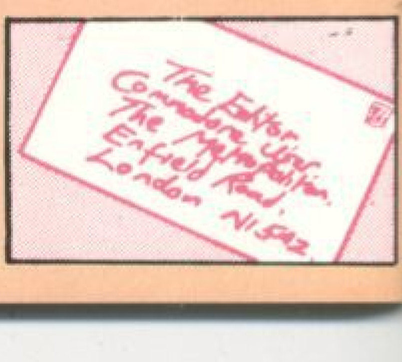
Compiler controversy rages on

I'm not able to enter into the controversy over which 64 Basic compiler is the better, DTL or Petspeed, since I only have experience of the former: but I found Mr. van Aardt's letter from South Africa most extraordinary.

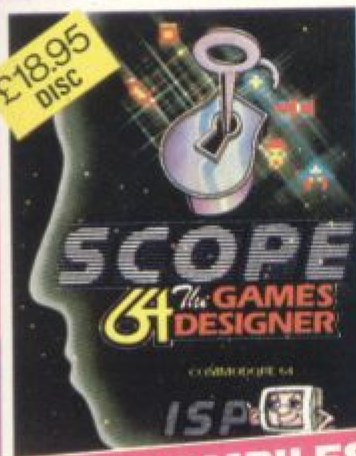
We have been using the DTL 64 Basic compiler in conjunction with our Cash Traders' Bookkeeping System since August – and can assure any of your readers who may have been worried by Mr. Aardt's letter that (provided the 1541 disk drive is functioning correctly) the DTL compiler is trouble-free.

We find that our original program which is 31K bytes long is reduced to 21K bytes. We cannot offer meaningful speed figures because in the interpreted mode our program spends 90 per cent of its time in garbage collection! However the compiled version (the only version we sell!) has an optional feature whereby the VAT and net value of a purchase invoice can be calculated automatically from the gross. When the operator presses key S, the results of the two calculations are displayed on the screen in the blink of an eyelid – quite fast enough for most people.

Arnold L. Shaw, Director, Quick-Count Limited, 15 Neeld Crescent, London NW4



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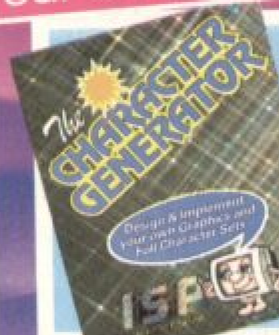
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DAMS modified

Re your article in **Commodore User** March 84 'Shedding light on the matter' I should like to shed some light on the DAMS Pixstik.

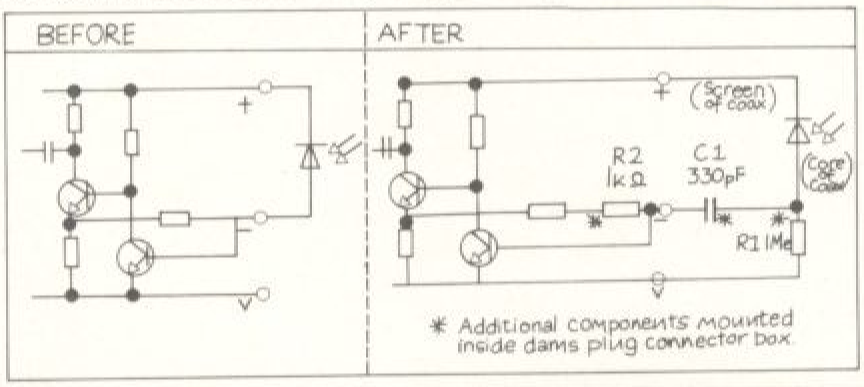
Ever since the early days of the university mainframe demonstrations I have eagerly awaited the advent of an affordable light pen. When I saw the first advert for the Pixstik for my 64 I thought that my dreams had come true and duly sent off my money. When the box eventually arrived I read the manual, loaded the artist program and plugged in the pen.

Well, I was really impressed with the software but quite disappointed with the pen. My dream was shattered. When used with my Ferguson TX colour television (which I consider pretty good) the light pen's cursor seemed to fly everywhere, especially to the right hand edge of the screen, and rarely where you pointed the thing.

I had a choice; do I ask for my money back? Or is there some design fault I can rectify? Now, sending it back would have meant more weeks without a light pen: and so I decided to prize it open and have a look. DAMS claimed that the 64 Pixstik was greatly improved: but the following obvious, simple, cheap modification made it much better. (I find it hard to understand why DAMS could be so penny pinching and then blame the limitations of technology).

Modification number 1: Strip off a half inch piece of black quarter inch diameter co-ax cable sheathing. Push this tightly over the lip of the lightpen leaving an eighth of an inch projecting beyond the tip. This has several immediate advantages. Firstly you now have a soft plastic tip instead of the photo diode lens or the metal case. No worries about scratching your television screens any more; the black plastic acts as the blinkers on a horse, making it look only where you point it; electro-static charges present on the TV screen do not now manage to discharge themselves into the metal case (thus preventing the cursor hiccups due to that); lastly, dust now gathers around the plastic rim and not the photodiode.

Modification number 2: It turned out that the rather inflexible flex is not screened against radio or electrostatic interference – when more than half of the flex was adjacent to the TV screen the cursor would not respond. As it happens, the flex is actually three wires of which only two are used. If one end of the wire which has been cut back is connected to the terminal marked V on the DAMS pcb, the extra screening effect of this gives a two-fold improvement allowing more of the flex to be closer to the screen without causing problems. And a complete cure to this interference problem can be achieved by replacing the coily flex altogether with standard microphone co-axial cable. When this is done the extra cable length also enables much more freedom of movement. I am using six feet of 2.5mm sheath diameter audio microphone cable.



Modification number 3: Look at figure 2 – capacitor C1 and resistor R1, now AC-couple the photodiode and transistor stages. This enables correct operation in a much larger range of ambient lighting conditions and removes the need for a dark screen border. The brightness control of the television set does now not have to be adjusted very critically, and local variations in screen brightness levels are in the main compensated for.

Modification number 4: The inclusion of resistor R2 in series with the existing resistor on the base of the input transistor increases the gain of the circuit, the result being that the pen works on most screen colours except dark red and large areas of black.

D.R. Donnelly, 24 Portrea Close, Davenport, Stockport, Cheshire SK3 8RU.

CLASSIFIED

Vic-20 plus cassette + 16K Rampack, security copy tape, 16K Skramble + 7 others, misc. games, User Reference manual, Quickshot joystick. Sargon II Chess, Jupiter Landing + two adventure cartridges. Nine months old £125. Write: S Connelly, 382a London Road, Leicester LE2 2PN.

Big Vic-20 nearest £300 secures cartridge 16K, Prog. Aid, Super Exp. Sargon, Stack Vickit 4, Vickit 5. Custom built switchable motherboard, Intro to Basic and Gortek. Four books and mags. Games available on tape. R.E. Warren, 5 Arthog Drive, Hale, Altringham. Tel: 061 904 0460.

For sale CBM64 1525 printer, C2N cassette unit, joystick, printer paper, labels, magazines, computing book and software worth over £100. Must go all together. Offers for the whole lot to: Mr. A Saggar, 88 High Street, Southall, Middlesex UB1 3DB. Buyer must collect or arrange delivery.

Sale! Vic-20 plus manuals, 16K expansion, Super Expander, Programmer's Aid, 7 cartridge games, Intro to Basic, £200 of software, Programmer's Reference Guide, many books, mags and listings. All in superb condition. Will send directly to you. Worth £500. Bargain at £200 ono. Contact: Lee Pearce, 46 Westward Road, Highridge, Bristol.

Discount software for the Commodore Vic-20 (and Apple II+). Vic-20 Software: Snakman (£5.75), Krazy Kong (£5.75), VIC Downs (£4.75), Mastermind (£5.35), Exterminator (£6.25), Amok (£5.75), Cricket (£5.75), Escape (£5.75), Bomber (£5.75), Rescue from Nufon (£5.75), Cosmic Brewers (£6.25), Dog Race (£4.95), Fuel Pirates (£5.75), Blowup (£5.75), Skiing (£3.95), Superclimber (£5.75), Othello (£5.75), Surfin Sun (£5.50), Draw (£4.35), Spell Master (£5.20), Memory (£4.70), Plow by Numbers (£4.75), Jumble (£4.75), Correct Change (£4.35), Ultimate Math Drill (£4.30), and much more. Disk add £1.50. Specify Vic-20. To order write Discount Software, PO Box 1489, Niagara-on-the-Lake, Ontario, Canada L0S 1J0.

Vic-20 (21K) C2N recorder, printer and plotter, many cassettes and cartridges, Tac 2 joystick, dust cover, book. Still under guarantee. Bargain at £210 ono. Contact 37 Chatburn Park Drive, Clitheroe, Lancs or Tel: (0200) 23276.

Speech synthesis for the Commodore 64. Unlimited vocabulary. Price £25.00 including p&p. Cassette based demonstration program and full instructions. Send sae to PO Box 28, Portsmouth PO4 9SH.

Vic-20 software all good makes: Melbourne House, Rabbit, Anirog, Llamasoft, Pixel, Mr Micro. Includes Laserzone, Gridrunner, Andes Attack, Trader, Mysterious Island, 16K Kong. Guaranteed good price, good condition. Phone (0302) 536462 after 5pm, weekends, anytime.

Commodore 64 owners

Midland Computer Library

All games originals, over 250 titles, cassette disk ROM, 25 new titles per month, discounts off new software, special offer for new members. A free game offer, first two games lent free.

Send large sae for details.

MCL, 31 Evenlodge Close, Lodge Park, Redditch B98 7NA. Tel: (0527) 26051.

Sums for fun. Early primary school arithmetic help for your children. On cassette for unexpanded Vic-20. Only £2.00 inc p&p. Cheques, PO to G. Foster. Box 010.

28K Vic-20 plus machine code monitor, 40/80 column card, 4-slot motherboard, C2N, joystick. Over £100 of software (cartridge and cassette) and books. A bargain at £225 ono. Phone Norwich (0603) 35735 after 6pm or write to A van Winkelen, 51 Pound Lane, Thorpe St Andrew, Norwich NR7 0UN.

Rem if you have got a second hand Commodore 64 or BBC A/B you don't want then drop me a line because I might buy it. Tel 0462 811699. Ask for Steven.

Header reader reveals hidden secrets of tape headers. Datarox menu driven utility for transferring or reading sequential files to/from tape/disk. Both programs have printer option. C64/Vic-20 (Exp)/Vic-20 (Unexp) version available. £5.50 each/£10 both. Specify version. G Sampher, 8 Willowby Gardens, Gillingham, Kent ME8 8TB.

Personal back up copies for CBM64. Will copy most cassette based software from cassette to cassette or cassette to disk with instructions. Send £3.50 to: 54 Livingstone Road, Walthamstow, London E17.

Toddlers! Play with your parents' CBM64. Animated musical flashcard and spelling program, developed in collaboration with school and educational psychologist. Suitable 1½ – 7yrs. Cassette £4.50; Disk £7 from: Toddlersoft, 1 Cat Lane Cottage, Ewelme, Oxon OX9 6HX.

14 year old wants penpal who owns a 64. Exchange programs and ideas. Write to: Steven Oliver, 20 Chacombe Road, Middleton Cheney, nr Banbury, Oxon.

For sale Commodore 64 and 1525 printer, cassette unit, joystick, £50 software inc. Wordpro Database, Matrix, Jammin', etc. Boxed, new, £400. Oxford 513206.

Echo superb Basic and M/C tape copier. Written in M/C and copies most commercial software. Supplied on a quality cassette containing full instructions for CBM64. Send £5.50 to: Echo, 5 The Birches, Victoria Way, Charlton SE7. This is a professional program!

For sale Commodore 64 complete with cassette recorder, joystick, games, Intro to Basic, books. £300 spent, bargain at £210. 4 months old. Tel: 061 483 0344. A Coxon, 162 Totridge Close, Offerton, Stockport, Cheshire SK2 5NN.

Commodore 64 Utilities. Two superb utilities to assist all CBM64 owners. Utility 1. Back-up Utility. This will allow the user to make personal back-up copies of mos cassette software available onto tape or disk. Utility 2. Tape to Disk Utility. Will help transfer your cassette software onto disk. Both supplied on data cassette with full written instructions, priced at just £4.99 each or send sae for full details to: Clark Kent Software, 26 Northcape Walk, Corby, Northamptonshire NN18 9DQ.

Sophisticated character generator written in M/C for the unexpanded Vic-20. Includes vert. and horiz. reflection, reverse, select, transfer, data statements, binary save, load. Instructions included. £4.75 inc. p&p. Brian Thompson, 19 Redacre Road, Gorton, Manchester 18 MI8 8RD.

MUSIC PROGRAMS

Major distributor and publisher of printed music & video tutorial material seeks music orientated programs for SINCLAIR, COMMODORE, BBC MICRO, DRAGON & ORIC home computers. Programs should be original & preferably educational although music 'games' with some teaching content will also be considered.

MUSIC SALES LIMITED
Attention of Neil Hammerton,
Newmarket Road, Bury St. Edmunds,
Suffolk. IP33 3YB

CU

Wanted pen pal to exchange info about Vic-20. I am 35, male, have disk, tape printer. Terry Zimmermann, 749 Huntington Parkway, Nashville, TN 37211, USA.

Exchange your unwanted Commodore 64 software via Humphrey Software. Only 75p per swap. Send sae for details to: 49 Underdale Road, Shrewsbury, Shropshire SY2 5DT.

US 64 user wishes to trade software with UK user. Products of both countries are very different. Sybiosis desired. Write: Andrew Brust, 308 West 4th Street, NY, NY 10014, USA.

Home accounts. Put your house in order! Probably home computing's best use! Comprehensive coverage of bank accounts, credit cards, H.P. Inbuilt accuracy check. Records all transactions. Projects cashflow for any period ahead. Available for CBM64 or Vic-20. £12 or FREE details from R.B. Computer Services, 2 Hazlewood, Windmill Hill, Brixham, Devon. Tel: 080 4555532.

Home accounts. Put your house in order! Probably home computing's best use! Comprehensive coverage of bank accounts, credit cards, H.P. Inbuilt accuracy check. Records all transactions. Projects cashflow for any period ahead. Available for CBM64 or Vic-20. £12 or FREE details from R.B. Computer Services, 2 Hazlewood, Windmill Hill, Brixham, Devon. Tel: 080 4555532.

Commodore 64 software. All in original packaging. On disk: Easy Script (£40), Easy Stock (£45), Future Finance (£45), Superbase-64 (£60), P.A.L. Assembler (£40), Music Construction Set (£20). On cassette: Synthy-64 (£6), Interceptor Assembler-64 (£3), Rabbit Graphics Editor (£3), Gridrunner (£4), Matrix (£4), Attack of Mutant Camels (£4), Hover Bovver (£4), Motor Mania (£4), Escape M.C.P. (£3). On cartridge: Simon's Basic (£30). Alternatively will sell the lot for £275 (total retail value over £500). Telephone: Fleetwood (03917) 71179 and keep trying!

Compute a Frog. Want French penpals (age 11-15) interested in Commodore computing, to exchange programs etc? Contact: The French Connection, Section 'Patamatique, College Pierre Dubois, 71 Rue Victor Boissel, 53017 Laval, France.

Wanted; a penpal to swap ideas with. I'm only an intermediate programmer. Please answer this advertisement and write to: Antonio Cataldo, 2 Yeovil Court, Mulgrave, Victoria, Australia, 3170.

Vic-20 + tape deck + 16K RAM + four slot motherboard + speech synthesiser + Intro to Basic Part 1 and 2 +lots of software + Programmer's Reference Guide + game cartridge + other bits: cost £315 sell for £200 ono. Phone: Southend 545807.

Commodore 64 with Maxim recorder and interface, Quick Shot joystick and three games Lazarian, Arcadia and The Golden Baton £220 inc p&p. You can save over £50 on this unit. Phone: Neyland 601021.

International software exchange club desires to exchange quality CBM64 software. Actually we have about 400 programs. Send your list to: I.S.E. (Ref A), PO Box 21 57100 Livorno, Italy.

C64 64K and disk drive 1541 both together £250. Tel: Cardiff (0222) 36197. Might sell separately.

Sporting Forecasts programs by Professor Frank George for Commodore 64. Horse Race Forecast, Football Forecast and Poolperm now available. Details from Poringware, PO Box 161, Brundall, Norwich.

Vic-20 for sale with software. Includes eleven popular cartridge games and three free cassettes. Cartridges would cost £110 if bought separate but with Vic £85. Must be sold together. Phone 021 705 6346 anytime, or write: T Crowley, 13 Marsham Court Road, Solihull, West Midlands B91 2ET.

Single disk back-up for Commodore 64. Completely full disk copied in twenty minutes. Three insertions per disk. For details send sae to 37 Coombe Avenue, Bournemouth, Dorset.

Commodore 1520 printer plotter as new £80. Tel: (0932) 241242.

Vic-20 tape backup copier, copies 95% of programs currently on sale, only £3.00 + 50p P&P. Send money to Mr N Mills, 70 Mill Beck Lane, Cottingham, N Humberside.

Vic-20 plus 16K Rampack, also C2N cassette deck, books, magazines and software. All offers to P Rowen, 24 Glenholme Avenue, Belfast BT8 4LU.

Wordcraft Word Processor for Vic-20 cartridges also contains 8K usable RAM only £50. Phone: Wakefield 262571.

Stack storeboard with 8K RAM fitted, Super Expander cartridge and Sargon II chess cartridge. £45. Phone: (0924) 473037 after 6pm.

40 column screen converter for the Vic, on cassette by Audiogenic £6. Centronics Interface and cable for Vic, enabling use of parallel printer £15. Phone after 7pm: Stoke-on-Trent (0782) 641029.

BC Basic cartridge £40 ono. Unwanted present. Ring: Blackpool 62277. Barry, 40 Burnside Avenue, Blackpool FY4 4AF.

Vic software sale: Gridrunner £3.25; Star Defence £4.75; Martian Raider £3.50; Quest of Merravid £4.75; Star Warp II £3.25; Frogrun £3.50. Originals. Mr M Taylor, 16 Gleeson Drive, Orpington, Kent.

Vic-20 software (will separate). Super Expander, Home Office, Skrambles, Chess, Jetpac, Hellgate, Myriad Nightcrawler, Hoppit. Price negotiable. Tel: (020639) 3062.

Vic-20 4 slot motherboard + 16K Rampack + Super Expander + Program Aid + Light Pen. £100 ono. Alan 01-390 5043.

Wanted penpal for Vic-20 user. Swap tips etc. Age 16, name Karen Jaine Duffy, 4 Lane End Road, Burnage, Manchester 19 1WA.

Simons Basic for CBM64. 114 new commands in cartridge. Phone for details on: Guildford (0483) 233201 any time, only £29.

Vic-20 software to sell (£4 per tape) or swap. 20 great titles. Sae for list to S Willis, 12 Lansdowne Road, Chatham, Kent.

Natural health centre urgently requires programs relative to natural therapies (eg: biorythms, astrology, homeopathy, herbalism, aromatherapy, etc) Please telephone Geoffrey Keyte at: 0908 670391.

Wanted urgently. Commodore 1520 printer plotter manual to buy or copy. Willing to pay. Tel: Padgate 818189 after 6pm. Please ask for Joe.

Commodore 64 penpal out there? age 14-16, with a view on swopping ideas and knowledge, etc. Name: D. Rossiter. Address: Barn Cottage, Middle Blagdon Lane, Paignton, Devon TQ3 3YE.

Vic software for sale due to purchase of 64. Various games £2 to £6. Also Programmer's Aid Cartridge £15. Phone: Guildford 39966.

Programs for CBM64 on disk: send me your prg lists, I'll send mine in return (have over 500 prgs) Øivind Amlein, Finstadrabben 97, N-1475 Finstadjordet, Norway.

Wanted: English software suppliers willing to ship 64 software to America. Send list/catalogue to Samuel Lubell, 56 Meadow Road, Briarcliff Manor, New York 10510, USA.

Toddlers! play with your parents' CBM64. Animated, musical flashcard and spelling program, developed in conjunction with school. Suitable 1½ - 7 years. Cassette £4.50, disk £7.00 from: Toddlersoft, 1 Cat Lane Cottage, Ewelme, Oxon OX9 6HX.

Wanted: Jelly Monsters cartridge. Will swap for Avenger cartridge and chess cartridge or two tape software cassettes. Contact: Ibrahim on 01-241 0370. London, Hackney.

Trade CBM64 programs Write Ric Kube, McCutcheon Street, Waikerie, SA 5330, Australia. Please send list.

Arrowspeed cartridge for Commodore 64, very fast save and load of all tape programs plus other functions. Two months old, only £36. Medford, 7 Thorn Grove, Hale, Altringham, Cheshire WA15 9AW.

Swap Imagine's Bewitched cassette (any Vic 20) for any other Imagine cassette. Tel: 0570 470362 after 6pm.

I have a very original idea for a computer game, but I haven't the skill or time to write it. Any offers? N Tregenza, 1 Gurlyn Hill, Relubbus, Penzance, Cornwall.

Wanted someone who wishes to swop programs for the Vic-20 or to buy games, many titles including arcade. Paul Wicolson, 6 Kirkmeadow, Bretton, Peterborough, Tel: 269736.

Swap complete set of golf clubs, bag, trolley, umbrella etc for Commodore printer or compatible printer for CBM64. Ring: Letchworth 6854. Beardsley, 11 Jarden, Letchworth, Herts SG6 2NP.

Commodore 64 plus C2N cassette, Introduction to Basic, and Spriteman £190. Abingdon 31871.

Wanted Commodore 64 disk drive and printer in good working order. Can collect locally. M Walton, 70 Maple Crescent, Newbury, Berks.

Vic-20 16K RAM, Programmer's Reference Guide. Blitz, Flight 0-1-5 games. Some Vic magazines £75. Tel: Rustington 75989. Keeble, 10 The Framptons, East Preston, West Sussex.

Trader for Vic + 16K. Original in good condition. Booklet included. Sell for £10 or consider exchange for cartridge (please specify). Phone: 0604 39779 after 6pm.

Vic-20 software for sale. Cassettes £3, cartridges £5. Many top titles. 16K memory £10. Send sae for list. Martin Webb, 30 Helena Street, Mexborough, South Yorks S64 9PF.

CBM 64 software Spriteman, Maths (GCE) and Music Composer £5 each or swap. 01-998 3712, ask for Barry.

If your age is greater than ten but less than 14 and you have a Vic-20 micro listen – if you are bored with your Vic games and want a penpal to exchange software with, contact: J Watson, 6 Redwood Glen, Chapeltown, Sheffield S30 4EA or phone 0742 (if outside Sheffield) 463565 after 4pm.

CBM64 copier and header reader. Will backup large proportion of cassette based software onto tape and disk. Available on disk £8 or tape £6. Cheques/PO to: Simon Harris, Box 011.

Any Commodore 64 users overseas who want to swap information and software. I have games and magazines from America. Send to: Roy Lew, 126 Mitford Street, Elwood 3184, Victoria, Australia.

Future Finance business software on disk. Unwanted and unused gift. £34 including carriage. Phone: Lancaster 67579.

Vic-20 + cassette + over £130 software, books, games, dustcover. All for £160 ono. Bill, 12 Winchester Road, Bexleyheath, Kent. 01-304 4741.

64 utilities and games to swap disk or tape. Many titles. Tel: 0522 27783 evenings or weekends. A Stafford, 144 Carholme Road, Lincoln LN1 1SH.

Commodore 3032, dual disks, Wordcraft, Simplicalc, games, books, tookit, printer interface. Bargain £475. Also selling programs for CBM 64: Easyscript, High Flyer. Tel: David, Hornchurch 040-24 55733.

Vic-20 plus 8K RAM pack, 7 arcade cartridge games, book of games. Part 1 Basic course. No cassette deck. £120 the lot. White, 6 Station Cottages, Hitchin, Herts SG4 9UN.

Vic-20 software for sale: Defender, Panic, Bewitched, Mini Kong, Wizard and Princess. All originals from Bubble Bus, Bug Byte, Imagine, Anirog, Melbourne House. Sae to : 73 North Road, Audenshaw, Manchester M34 5RJ.

CBM 64 copier plus header reader program. Make backup copies of your favourite software. On tape only. Instructions in program. £5. R Stone, 64 Cwmamman Road, Glawamman, Ammanford, Dyfed, S. Wales.

Sales and swaps for unexpanded Vic. Cassettes and cartridges including Avenger, Tornado, Arcadia. All offers considered. Phone Rupert on 021 454 0234, Monday to Friday, 4.30pm to 7pm.

Vic-20 games: Arcadia, Skramble, Space Rescue, Catcha Snatcha, Gold Rush, Wizard and Princess. All for unexpanded Vic, and cost only £4 each. All originals. D.S. Nash, 43 Hempcroft Road, Timperley, Altrincham, Cheshire WA15 7JG. Tel: 061 980 5232.

CBM 3020 model 32K memory. Want £240. Only 2 years old, hardly ever used. Phone: 01-959 2185 (buyer collects).

64 software club: all Commodore 64 users who are interested in obtaining quality public domain software should join Club 64, 85 Upper Drumcondra Road, Dublin 9, Ireland.

15 year old boy wanting girl penfriend. Would prefer any girl who knows any amount of programming on the Vic-20. Gary J Nattrass, 9 Leaventhrope Avenue, Bradford 8, West Yorks.

Penpel for inexperienced sixteen year old. Can come from anywhere in the country. My address is Alison Muir, 22 Glen Ogilvie, St Leonards, East Kilbride, Glasgow, Scotland G74 3SY.

Romik Multisound Synthesiser for unexp. Vic-20. Price – only £4.50. Telephone: Braughton 812619 and ask for Colin.

Vic-20, Vixen 16K, Buti Plus, Sargon II Chess, Jelly Monsters, Motherboard, Reference Guide, Dr Watson and dozens of cassette games. All boxed. £160. Colin Lennox, 16 Hutton Street, Sunderland SR4 7HB. Tel: 0783 79098.

Needed 1 Vic-20 or Commodore 64 for a company to be used as a normal computer and a home computer. If you have one for sale ring: Fleet 22870 (Hampshire).

Intro to Basic 1 £10 ono, barely used. The Count Adventure £5, Alien Blitz £6 or set £18. Contact: Jackie McIntyre, 1 Lever Park, Portstewart, Co Londonderry, N Ireland. (Vic-20)

Help needed desperately. Lady tearing her hair out needs help to solve adventure game, Tomb of Xeiops. Greta Halliday, 14 Hazelhurst Drive, Cheddleton, nr Leek, Staffordshire. 0538 361160.

14 year old boy would like penpal to swap tips for Vic-20 + Super Expander. Write to: Dominic Ramsey, 2 The Paddock, Haddenham, Bucks HP17 8AG.

Vic-20 Super Expander £20. Also Sargon Chess £8, or both for £25, Brian Thompson, 19 Redacre Road, Abbey Hey, Gorton, Manchester 18 M18 8RD.

Datassette unit model C2N unused, boxed. Surplus to requirements £25. Phone: St Albans 54119 evenings.

Wanted 1515 printer manual. Need help Vic-20 Basic programming? If you're stuck maybe I can help. Hints and ideas exchanged. Contact Terry Rushent, 14 Weston Avenue, Leighton Buzzard, Beds LU7 8QY.

Commodore 64 listings: send your tape or disk with large sae and £1.20 for fast return to: J Ratsey-Woodroffe, The Retreat, Yarmouth, I.O.W, PO41 0XW. Large amount of software to swap!

Unwanted Commodore games given as a birthday present, want to sell Krazy Kong, Arcadia, Scramble 64, and Annihilator. All new, want £20. Originally sold for £25. Please write to: Hitesh Shah, 53 Tottenhall Road, Palmers Green, London N13 6HY. Will consider selling separately.

CBM64 disk drive and printer, dust cover, disk box, 20 disks, paper, 5 games + cassette interface + BC Basic, Advanced Programmer's Guide. £450. Phone: 01-515 6202 after 7pm, Peter Shores.

My complete computer system for sale. Includes: Commodore 64, cassette unit, 1541 disk drive, 1520 printer plotter, desk, joystick, games, manuals, magazines. Haggle around £425. Please ring: Tadley (07356) 4579.

Wanted to form or join CBM64 users club, Castle Point, Essex. Phone Ian on Canvey Island 682719.

Vic-20 for sale: Avenger £4, Arcadia £3.50, Andes Attack £3.50. Wanted: Audiogenic's Forth, Compute's First Book of Vic, Epyx's Crush, Crumble and Chomp, and Atarisoft's Defender. Phone now! 0558 822509.

Vic speech synthesiser for sale. Cost £49.95. Will sell for £20 ono. Wanted vgc Datasette recorder. Will buy or swap for speech synthesiser. Phone Richard on: Welwyn Garden City 28587.

CBM64 International Software Exchange. Send your software list to German user group, Buchenweg 3a, 6909 Walldorf, BRD.

Vic-20 16K, Super Expander, Intro to Basic 1, £100 software, will consider splitting. Telephone: Atherstone 3017.

Vic-20 cartridges: Programmer's Aid, speech synthesiser built from Maplin Talk Back – working! £20 each or both for £35. Phone: 021 3536383.

Vic-20 games for sale: Munchman £4.50, Metagalactic Llamas £5, will swap for other games. Gary Turner, 19 The Parks, Sundorne Grove, Shrewsbury SY1 4TJ. Tel: (0743) 61967.

Vic-20 for sale, boxed, with C2N cassette recorder, 3K RAM pack, Programmer's Reference Guide, and a selection of games. £75 for quick sale. Tel: (0734) 785690 after 5pm.

Arfon seven slot expansion unit for Vic (switched) plus 8K, Super Expander, Prog Aid £100. Will separate. 35 Alder Close, Hetton-Le-Hole, Tyne & Wear. Tel: 0783 262140.

Vic-20 user wants teenage penfriend for exchange of games ideas, etc. Preferably from southern England. Contact: Tiz (jnr), 6 Woodside Close, Northorpe, nr Bourne, Lincs PE10 0HW. (Age 13).

Vic-20 + 32K RAMpack + Gorf cartridge and three other games worth £180. Sell for £140. Address Hawthorns, Palms Hill, Wem, Salop. Tel (0939) 32810.

Irish Vic owner interested in contacting other fanatics to swap games, tips etc. through post. Write to: Fergal McGirl, 27 Sycamore Road, Finglas, Dublin 11.

Disabled 64 beginner would like to join computer club Stoke-on-Trent area. Fred Bates, 27 Chilton Street, Heron Cross, Fenton, Stoke-on-Trent, Staffs. Tel: 0782 323524.

Wacky Waiters for the unexpanded Vic-20 for sale £5. Also Metagalactic Llamas, Battle at the Edge of Time £5. Telephone: Brownhills 375836.

Vic-20 complete starter pack and two cartridge games, books and several cassette games to the value of £50. Perfect condition £120 ono. Telephone: 0942 812489.

Vic-20 C2N cassette 1540 disk, 1525 printer, Programmer's Aid, Super Expander, 16K RAM, software on disk and tape + mags. As new. £400 ono. Tel: Stevenage 350308.

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Ad – Index

Vic-20 plus C2N, Super Expander cartridge (3K), joystick, Introduction to Basic Part 1, cartridge and cassette games, mags, £150 ono. I Walker, 35 Deer Park Road, Langtoft, Peterborough PE6 9RD.

Vic-20 16K RAM C2N deck, Intro to Basic 1 & 2, Prog Ref Guide, joystick, £50 worth of software. Worth £280, sell for £180 ono. R Ikin, 14 Stratford Drive, Aldridge, Walsall, West Mids. Tel: Ald 54484.

Wanted second hand C2N cassette with leads. Please contact Jerry Jacangelo, 101 Waldrons Moor, Kings Heath, Birmingham B14 6RT. Phone: 021-444 0324.

Penpal wanted. Intestests are swimming, reading, computers and pop music. Age 13. If interested write to: Miss S Race, 2 Weston Avenue, Felixstowe, Suffolk IP11 9SB.

Disk Future Finance for 64 never used. Also various games. Exchange or sell. Phone: Brownhills (0543) 376721.

Vic-20, C2N, 16K and 3K RAM, Super Expander, joystick, £500 cassette software, £140 cartridge software including five Scott adventures, Choplifter, Submarine Commander, books worth £900. Sell for £480. Tel: 04862 67693.

Penpal wanted, aged about 15 who owns a Vic-20. If you are please write to: Gary Unthank, 56 St Mary's Crescent, Yeovil, Somerset BA21 5RR.

Please tell me if there is a backup copy tape for the Vic-20. Replies to: M Bennett, 228 Rullion Road, Penicuik, Midlothian, Scotland.

Commodore Vic-20, MPS-801 printer with paper, C2N cassette, 32K RAM Super Expander, adventure cartridge, joystick, £250. Original software, magazines, books etc. All boxed, excellent condition £45 ono. Ring. Uxbridge 70324.

Bargain Vic-20 16K plus many extras inc. recorder etc. £200. 0484 716241 for details.

Vic-20, cassette deck, 16K switchable rampack, lightpen, joystick, Programmer's Reference Guide, arcade games, Programming Aid programs, adventure cartridge. Phone: St Albans 25207 after 4pm. £180 ono.

Easy Script cheap £65 – new, unopened, never used plus seven other disk progs. N Laird, 98 Vanbrugh Park, London SE3 7AL. Phone: 01-853 3307 after 7pm. Also green phos monitor cheap.

Sale Commodore Pet 32K also 3040 twin dual disk drive, hardly used £500 ono. Hornchurch 70874.

Future Finance + manual + 5 games all as new £95 or swap for Superbase 64 + cash. Also BC Basic £15. C Constantinou, 43 Egerton Road North, Chorlton, Manchester M21 1SN. Tel: 061 861 8910.

CBM64 cassette, 1541 disk, Easy Script, joysticks, Hobbit, Pinball, Jumpman, Hungry Horace and many others. Also Programmer's Reference Guide, Machine Code Master, worth £600, boxed, under guarantee. Sell for £450. Tel: (evening) 01-352 4137.

Live out the thrills of the European Cup. Take your team to the glittering prizes. £3.50 tape P&P included. Cheques payable to J Peckitt, 6 Yeomanry Court, 90 Whalley Road, Whalley Range, Manchester.

CBM64 and C2N recorder £150. 1541 disk drive £150. 1701 colour monitor £150. All as new. Watford 44069 after 6pm.

CBM64 software for sale. Graphixel, Hustler, Gridtrap and Crazy Kong all for £20. Tel: Fishguard 872216 after 5pm.

Sharp PC1500 + 8K byte RAM expansion module cost £210. Accept £180 ovno. Tel: 061-789 5186 anytime.

Vic-20 + C2N for sale. Arfon Expansion unit (7 socket switchable), Programmer's Aid, Super Expander, RAM packs, Intro to Basic, tons of assorted software and books, £200 ono. Ring: 053 753 3288.

Vic-20 computer plus 16K RAM pack, cassette deck, Tac-2 joystick, £70 of the latest software i.e. Jetpac, Skramble etc. and dust cover! All for £100. Telephone: 061-434 1520 or write to: Mr. S Matthews, 25 Whitehall Road, Didsbury, Manchester.

Vic-20 only 6 months old, with joystick, 16K RAM, C2N, Intro to Basic Pt 1, magazines, original games. Only £160. Phone 061 980 5232 to confirm sale (After 5pm). You collect or add £5 to price, for P&P.

Vic-20 plus C2N recorder, 16K Super Expander, mags, cartridges, tapes, books, joystick. Worth £300 will sell for £150 ono. Telephone: Dalkeith 663 4389 after 5pm. Ask for Conor.

CBM64. Make your 64 talk with a Commodore Speech Synthesiser. S/hand with full instruction and interface, £30. Samle programs Basic and m/code. Stephenson, 25 Willow Garth, Scarborough, YO12 5HZ. Tel: 0723 362746.

Arrowspeed cartridge for Commodore 64, very fast save and load of all tape programs plus other functions. Two months old, only £36. Medford, 7 Thorn Grove, Hale, Altrincham, Cheshire WA15 9AW.

Hi all Vic-20 owners! I would like a penpal around my own age. My address is: Miss L Smith, 47 Northend Road, Erith, Kent. (age 14).